

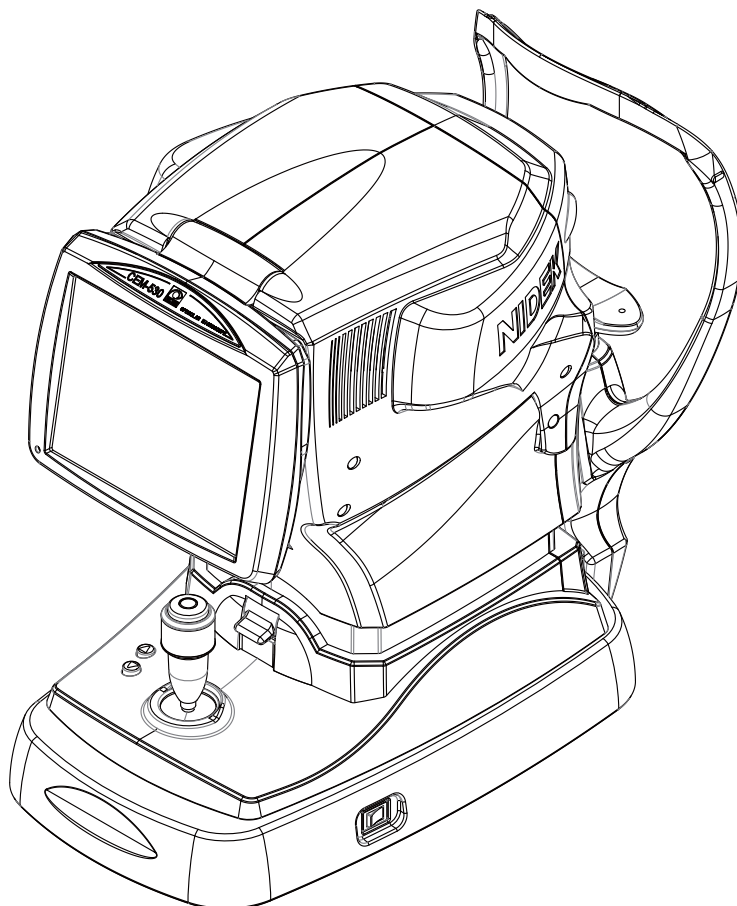
**NIDEK**

**SPECULAR MICROSCOPE  
CEM-530**

---

**SERVICE MANUAL**

---





Eye & Health Care

**NIDEK CO., LTD.**

**NIDEK CO., LTD.**  
(Manufacturer)

: 34-14, Maehama, Hiroishi-cho, Gamagori, Aichi 443-0038, Japan  
Telephone: +81-533-67-6611  
Facsimile: +81-533-67-6610

**NIDEK CO., LTD.**  
(Tokyo Office)

: 3F Sumitomo Fudosan Hongo Bldg., 3-22-5, Hongo,  
Bunkyo-Ku, Tokyo 113-0033, Japan  
Telephone: +81-3-5844-2641  
Facsimile: +81-3-5844-2642

**NIDEK INCORPORATED**  
(United States Agent)

: 47651 Westinghouse Drive, Fremont, California 94539, U. S. A.  
Telephone: +1-510-226-5700  
Facsimile: +1-510-226-5750

**NIDEK S.A.**  
(EU Authorized Representative)

: Europarc 13, rue Auguste Perret, 94042 Créteil, France  
Telephone: +33-1-49 80 97 97  
Facsimile: +33-1-49 80 32 08

---



# Table of Contents

<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. SAFETY PRECAUTIONS</b>	<b>3</b>
<b>3. SPECIFICATIONS</b>	<b>5</b>
3 . 1    Classifications	5
3 . 2    Specifications	6
3 . 3    Standard Configuration	7
3 . 3 . 1    Standard accessories	7
3 . 3 . 2    Optional accessories	7
<b>4. TROUBLESHOOTING</b>	<b>9</b>
<b>5. SUBTROUBLESHOOTING</b>	<b>11</b>
5 . 1    Initial Screen is not Displayed	11
5 . 1 . 1    Power source has trouble	12
5 . 1 . 2    Backlight of LCD (14101-E010) does not turn on	13
5 . 2    Error Message Appears	14
5 . 2 . 1    ERR001 (EEPROM Error.)	14
5 . 2 . 2    ERR002 (Clock Error.)	14
5 . 2 . 3    ERR031 (U/D Motor Error.)	15
5 . 2 . 3 . 1    U/D sensor signal abnormality	16
5 . 2 . 4    ERR032 (R/L Motor Error.)	17
5 . 2 . 4 . 1    R/L sensor signal abnormality	18
5 . 2 . 5    ERR033 (F/B Motor Error.)	19
5 . 2 . 5 . 1    F/B sensor signal abnormality	20
5 . 2 . 6    ERR043 (Printer Error.)	21
5 . 2 . 7    ERR601 (USB Device Error.)	22
5 . 2 . 8    ERR700 (CIFS Error.)	23
5 . 2 . 9    ERR703 (Hardware Error.)	24
5 . 2 . 10    ERR704 (DHCP Error.)	24
5 . 2 . 11    ERR750 (Can't Access Network.)	25
5 . 2 . 12    ERR751 (Can't Write File in PC.)	26
5 . 2 . 13    ERR754 (There is no PC Name in this Network.)	26
5 . 2 . 14    ERR756 (Can't Logon PC.)	27
5 . 2 . 15    ERR757 (There is no Shared Folder.)	27
5 . 2 . 16    ERR758 (Network Timeout)	27
5 . 2 . 17    ERR759 (Can't Delete File in PC.)	27
5 . 2 . 18    ERR760 (Network Initializing. Please retry.)	27
5 . 2 . 19    ERR761 (Access Denied.)	28
5 . 2 . 20    ERR762 (Account Disabled.)	28

5 . 2 . 21	ERR763 (Can't Read File in PC.) . . . . .	28
5 . 2 . 22	ERR766 (File Name is same. Can't Write File in PC.) . . . . .	28
5 . 2 . 23	ERR771 (Network cable is not connected.) . . . . .	29
5 . 2 . 24	ERR772 (There is no response.) . . . . .	29
5 . 3	Screen Touch Panel is not Operational . . . . .	30
5 . 4	Main Unit does not Move to Right, Left, Forward, or Backward Smoothly . . . . .	31
5 . 5	Capturing Unit does not Move Up or Down even when Joystick is Turned . . . . .	32
5 . 6	Fixation Lamp does not Illuminate . . . . .	33
5 . 6 . 1	Internal fixation lamp does not illuminate . . . . .	34
5 . 7	Chinrest does not Move Up or Down . . . . .	35
5 . 7 . 1	Chinrest up and down button signal abnormality . . . . .	36
5 . 7 . 2	Chinrest U/D sensor signal abnormality . . . . .	37
5 . 8	Image Capture cannot be Performed Properly . . . . .	38
5 . 8 . 1	Observation image is not displayed on screen. . . . .	39
5 . 8 . 2	Focus LED does not illuminate. . . . .	40
5 . 8 . 3	Auto alignment does not function. . . . .	41
5 . 8 . 4	Image capture does not start even when start button is pressed. . . . .	43
5 . 8 . 5	Image capture does not start even when alignment and focus are obtained . . . . .	44
5 . 8 . 6	Captured image is not displayed on screen . . . . .	45
5 . 8 . 7	Endothelium measurement data is not within normal range . . . . .	46
5 . 8 . 8	Pachymetry data is not within normal range . . . . .	47
5 . 9	Power LED does not Illuminate. . . . .	48
5 . 10	Printing cannot be Performed . . . . .	49
5 . 11	Brake cannot be Applied. . . . .	50
5 . 12	Right and Left Eyes cannot be Detected. . . . .	51
5 . 13	Device does not Enter Sleep Mode. . . . .	52

## **6. REMOVAL PROCEDURE . . . . .53**

6 . 1	Capturing Unit Front Cover ASSY (15201-6300), Capturing Unit Left Cover (15201-M707), Capturing Unit Right Cover (15201-M708) . . . . .	53
6 . 2	Capturing Unit Rear Cover ASSY (14101-6000). . . . .	55
6 . 3	Printer ASSY (14101-6200) . . . . .	56
6 . 4	Body Front Cover (18536-M702) . . . . .	57
6 . 5	Body Cover ASSY (32186-7030) . . . . .	58
6 . 6	Bottom Plate (30601-M002) . . . . .	60
6 . 7	Shading Cover (15201-M361). . . . .	62
6 . 8	Shading Cover 2 (15201-M362) . . . . .	64

## **7. REPLACEMENT PROCEDURE . . . . .65**

7 . 1	ASSYs. . . . .	65
7 . 1 . 1	Main body. . . . .	65
7 . 1 . 1 . 1	Setting the parameters . . . . .	69
7 . 1 . 2	Adjusted SM capturing ASSY (15201-9100) . . . . .	77
7 . 1 . 3	R/L motor ASSY (15201-2510) . . . . .	80
7 . 1 . 4	LCD ASSY (14101-6100). . . . .	83
7 . 1 . 5	Pad-attached LCD ASSY (14101-6110). . . . .	85
7 . 1 . 6	Joystick ASSY (10701-1260) . . . . .	87

7 . 1 . 7	Patient positioning ASSY (15411-1500) . . . . .	88
7 . 1 . 8	Chinrest ASSY (15411-1510) . . . . .	88
7 . 1 . 9	Brake ASSY (30601-2300) . . . . .	89
7 . 2	Boards . . . . .	90
7 . 2 . 1	Main board (15201-BA01) . . . . .	90
7 . 2 . 2	Driver board (15201-BA02) . . . . .	92
7 . 2 . 3	Base board (15201-BA05) . . . . .	93
7 . 2 . 4	Connection board (15201-BA08) . . . . .	94
7 . 2 . 5	TRC sensor board (15201-BA11) for right/left movement . . . . .	95
7 . 2 . 6	TRC sensor board (15201-BA11) for forward/backward movement . . . . .	96
7 . 2 . 7	TRC sensor board (15201-BA11) for up/down movement . . . . .	97
7 . 2 . 8	Peripheral fixation lamp board (15201-BA18) . . . . .	98
7 . 2 . 9	Fixation lamp board (15201-BA19) . . . . .	99
7 . 2 . 10	LCD board (14101-BA06) . . . . .	100
7 . 2 . 11	F/R/L sensor board (18536-BA25) . . . . .	102
7 . 2 . 12	U/D SW board (30601-BA09) . . . . .	103
7 . 3	Electrical Components . . . . .	104
7 . 3 . 1	Primary power source (15201-EA01) . . . . .	104
7 . 3 . 2	Power LED (14101-EA60) . . . . .	105
7 . 3 . 3	Brushless geared motor (15201-E006) . . . . .	107
7 . 3 . 4	Pulse motor (15201-E007) . . . . .	108
7 . 3 . 5	Brushless geared motor (15601-E008) . . . . .	111
7 . 3 . 6	Chinrest (32186-EA53) . . . . .	113
7 . 3 . 7	Printer (80606-00018) . . . . .	114
7 . 3 . 8	Printer interface board (80606-00019) . . . . .	116
7 . 3 . 9	Switching regulator (80602-00102) . . . . .	117
7 . 4	Mechanical Components . . . . .	118
7 . 4 . 1	R/L shaft (30601-M201) . . . . .	118
7 . 4 . 2	F/B shaft (30601-M103) . . . . .	119
7 . 4 . 3	Linear bush (82001-LM028) . . . . .	121
7 . 4 . 4	Linear bush (82001-LM097) . . . . .	123
7 . 4 . 5	Shading plate (32186-M051) . . . . .	125
7 . 4 . 6	Multistage stay (14101-M639) . . . . .	126
7 . 4 . 7	Sliding plate (32105-M102) . . . . .	129
7 . 4 . 8	U/D sensor plate (15201-M213) . . . . .	130
7 . 4 . 9	R/L sensor plate (15201-M260) . . . . .	131
7 . 4 . 10	F/B sensor plate (15201-M259) . . . . .	132
7 . 5	Consumables . . . . .	133
7 . 5 . 1	Joystick . . . . .	133
7 . 5 . 1 . 1	Start button (18535-M132) . . . . .	133
7 . 5 . 1 . 2	Rubber ring (32156-M156) . . . . .	134
7 . 5 . 2	Brake . . . . .	135
7 . 5 . 2 . 1	Rubber foot (820-47-1203A) . . . . .	135

## 8. CHECK/ADJUSTMENT/UPGRADE .....137

8 . 1	Activating Maker Mode .....	137
8 . 1 . 1	3. Check (SW, TP, Printer..) screen .....	139
8 . 1 . 2	5. Adjustment screen .....	141
8 . 1 . 3	Inspection screen .....	142
8 . 2	Attaching the Jigs .....	143
8 . 2 . 1	Chinrest attachment jig (32188-1100) .....	143
8 . 2 . 2	Calibration jig (15275-1400) .....	144
8 . 2 . 3	Resolution check jig (15275-1600) .....	145
8 . 2 . 4	Ronchi-ruling check jig (15275-1700) .....	146
8 . 2 . 5	Cell model eye jig (15275-2100) .....	147
8 . 2 . 6	Model eye (CL) unit (32961-0500) .....	148
8 . 2 . 7	22-model eye jig (32171-0600) .....	149
8 . 3	Checks .....	150
8 . 3 . 1	Power supply check .....	150
8 . 3 . 1 . 1	When turning on power .....	150
8 . 3 . 1 . 2	Driver board (15201-BA02) voltage check .....	150
8 . 3 . 2	Tracking check .....	151
8 . 3 . 2 . 1	Tracking function check .....	151
8 . 3 . 2 . 2	Auto tracking performance check .....	152
8 . 3 . 3	Switch check .....	154
8 . 3 . 3 . 1	Preparation .....	154
8 . 3 . 3 . 2	Start button function check .....	155
8 . 3 . 3 . 3	Chinrest up and down button function check .....	155
8 . 3 . 4	Touch panel check .....	156
8 . 3 . 5	Print check .....	158
8 . 3 . 6	Video print check .....	159
8 . 3 . 7	Chinrest check .....	160
8 . 3 . 8	Tracking check .....	162
8 . 3 . 8 . 1	Preparation .....	162
8 . 3 . 8 . 2	Tracking U/D check .....	164
8 . 3 . 8 . 3	Tracking R/L check .....	166
8 . 3 . 8 . 4	Tracking F/B check .....	168
8 . 3 . 8 . 5	Right and left eye detection check .....	170
8 . 3 . 9	Camera check .....	171
8 . 3 . 10	Fixation check .....	172
8 . 3 . 11	Joystick check .....	175
8 . 3 . 11 . 1	Capturing unit is not moved up or down by turning the joystick knob .....	175
8 . 3 . 12	Endothelium measurement accuracy check .....	176
8 . 3 . 12 . 1	Check capture area .....	176
8 . 3 . 12 . 2	Check cell density .....	196
8 . 3 . 13	Pachymetry accuracy check .....	203
8 . 4	Adjustment .....	211
8 . 4 . 1	Tracking adjustment .....	211
8 . 4 . 2	Endo image calibration .....	214

8 . 4 . 3	Pachy calibration .....	222
8 . 4 . 4	Touch panel calibration .....	236
8 . 5	Upgrade .....	238
8 . 5 . 1	Software version check .....	238
8 . 5 . 2	Firmware upgrade .....	239
8 . 5 . 3	Adjustment data recovery .....	242
8 . 6	Settings .....	244
8 . 6 . 1	Preparation .....	244
8 . 6 . 1 . 1	Maintenance .....	244
8 . 6 . 1 . 2	Parameter settings .....	245
8 . 6 . 2	LAN settings .....	246
8 . 6 . 2 . 1	Preparation .....	246
8 . 6 . 2 . 2	TCP/IP setting .....	247
8 . 6 . 2 . 3	File sharing setting .....	249
8 . 6 . 3	Reader settings .....	255
8 . 6 . 4	Touch panel calibration .....	258
8 . 6 . 5	Date and time setting .....	260
8 . 6 . 6	Information check .....	261
8 . 6 . 7	Capture condition setting .....	262
8 . 6 . 8	Print setting .....	264
8 . 6 . 9	Other settings .....	268
8 . 6 . 10	Printing .....	269

## **9. SUPPLEMENT .....271**

9 . 1	Configuration .....	271
9 . 1 . 1	Front view .....	271
9 . 1 . 2	Rear view .....	272
9 . 1 . 3	Bottom view .....	273
9 . 2	Labels .....	274
9 . 3	Wiring Diagram .....	276
9 . 4	Connector Cable .....	277
9 . 5	Layout of Boards, Connectors, and Test Pins .....	289
9 . 5 . 1	15201-BA01 .....	289
9 . 5 . 2	15201-BA02 .....	291
9 . 5 . 3	15201-BA08 .....	293
9 . 6	Error Message List .....	294
9 . 7	Parts Layout .....	296
9 . 7 . 1	Boards (BA**) .....	296
9 . 7 . 2	Cables and cable units (CA**, EA**) .....	298
9 . 8	Jig List .....	299
9 . 9	Adjustment List .....	301
9 . 9 . 1	Adjustments after unit replacement .....	301
9 . 9 . 2	Adjustments after board replacement .....	302
9 . 9 . 3	Adjustments after electrical component replacement .....	303
9 . 9 . 4	Adjustments after mechanical component replacement .....	304
9 . 10	Screw List .....	305

This page is intentionally left blank.

---

# 1 INTRODUCTION

---

This Service Manual is for the NIDEK SPECULAR MICROSCOPE, CEM-530.

For correct service, thorough understanding of the contents in this manual is required prior to the service.

Refer to the Operator's Manual and Parts List for the CEM-530.

In case the device cannot be repaired according to the procedures described in this manual, please report the serial number of the device and details of the symptom or symptoms.

Refer to the Service Manual Annex for important changes.

This page is intentionally left blank.



---

## 2 SAFETY PRECAUTIONS

---

### 1 . Requirements for prior contact regarding repair





- 1 ) When conducting repairs described in the Service Manual or Service Manual Annex, prior contact with NIDEK is not necessary.
- 2 ) When conducting repairs not covered in the Service Manual or Service Manual Annex, prior contact with NIDEK Service Department in writing is required.
- 3 ) When for some reason, repairs were conducted because they needed to be done immediately, or other such circumstance, contact NIDEK as soon as possible in writing after conducting repairs to the device.

### 2 . General precautions

- 1 ) Repairs by the Service Manual or Service Manual Annex must be performed by personnel who have undergone training at NIDEK.
- 2 ) Conduct repairs according to the procedures described in the Service Manual or Service Manual Annex.
- 3 ) Never wipe the covers using an organic solvent such as paint thinner.  
Doing so may ruin the surface and impair the appearance of the device.

### 3 . Maintenance cautions

- 1 ) Take antistatic precautions prior to repair.
- 2 ) Take proper care against electric shock during repair.
- 3 ) Tighten or loosen screws with proper tools.
- 4 ) Never drop parts or screws inside the device.
- 5 ) Prepare storage cases so as not to lose the removed screws or parts.
- 6 ) After loosening the screws fastened by a threadlocking adhesive, be sure to reapply the threadlocking adhesive to the screws when retightening them.
- 7 ) After replacing parts, confirm that they are fastened in their original positions securely before turning on the power.
- 8 ) See Wiring Diagram and Connector Cable to check cable breaks as described in TROUBLESHOOTING. In addition, check the following:
  - a . Connectors are connected and crimped properly.
  - b . No contact failure occurs after re-connection of connectors.
  - c . Cables are soldered properly.

\* Do not yank the cables with excessive force. Doing so could cause cable breakage. Never conduct repairs with wet hands. Electric shock or failure of the device may result.
- 9 ) The  labeled area indicates high voltage. Take proper precautions against electric shock.
- 10) When a cable with any of the following marks is disconnected and reconnected, be sure to confirm that the screws are tightened securely.
  - a . Protective ground: 
  - b . Functional ground: 
  - c . Equipotential: 

4 . Adjustment precautions

- 1 ) Confirm that the following conditions are met before installation.
  - a . A place which is level and stable without vibration and shock
  - b . No exposure to direct sunlight or ultraviolet rays
  - c . A place with minimal external light sources
  - d . No exposure to water
  - e . A place where temperature and humidity meet the specifications for use
- 2 ) Never use the adjustment jigs for purposes other than those intended.

5 . Caution after repairs

- 1 ) Confirm that the device operates properly after repairs.

---

## 3 SPECIFICATIONS

---

### 3.1 Classifications

1 . Type of protection against electrical shock: Class I

The CEM-530 is classified as a Class I device.

A Class I device is one in which, in addition to basic insulation, protection against electric shock is provided by connecting the device to a grounding source to prevent accessible metal parts from becoming electrically charged, should the basic insulation fail.

2 . Degree of protection against electrical shock: Type B applied part

The CEM-530 is classified as a device with a Type B Applied Part.

A Type B Applied Part provides a particular degree of protection against electric shock, particularly regarding the following:

- allowable leakage currents
- reliability of the protective earth connection (if applicable)

3 . Conformity to electromagnetic compatibility standard

The CEM-530 conforms to IEC60601-1-2: 2007.

4 . Degree of protection against harmful ingress of water: IPX0

The CEM-530 provides no protection against ingress of water with harmful effects.

Avoid splashing water or other liquids on or near the device.

5 . Degree of safety of application in the presence of a flammable anaesthetic mixture with air, or with oxygen or nitrous oxide

The CEM-530 is not suitable for use in the presence of a flammable anaesthetic mixture with air, or with oxygen or nitrous oxide, or flammable cleaning agents.

Do not operate the device near flammable type materials.

6 . Method(s) of sterilization or disinfection recommended by the manufacturer

The forehead rest and chinrest can be cleaned with a cloth dampened with rubbing alcohol as necessary.

7 . Mode of operation

The CEM-530 is a continuous operating device.

8 . Classification by Transportability

The CEM-530 is classified as a stationary device.

## 3.2 Specifications

1 . Endothelial image capture	
Photographic field	0.25 mm (W) × 0.55 mm (H)
2 . Pachymetry	
Measurement range	300 to 1000 $\mu$ m
Measurement unit	1 $\mu$ m increments
Accuracy	$\pm 10$ $\mu$ m
3 . Working range of auto tracking	
Up and down	32 mm
Right and left (during alignment)	$\pm 5$ mm
Right and left (during capturing)	$\pm 8$ mm
Forward and backward (during alignment)	$\pm 5$ mm
Forward and backward (during capturing)	Forward: 8 mm Backward: 5 mm
4 . Movable range	
Capturing unit	Forward and backward: 36 mm Right and left: 85 mm
Motorized chinrest	Up and down: 62 mm
5 . Printer	Thermal line printer with auto cutter Video printer (optional)
6 . Observation/Display	
Display	8.4-inch color LCD monitor with tilt function
Display item	Endothelial image, analysis results, corneal thickness, anterior segment image, icons
Monitor	There are no tilt, irregularities, or scratches that may affect vision on the display. Can be lifted up 75° or more from the initial position. Can be fixed at the initial position with the magnet. Each fixed position (5 steps) is held firmly for secure touch operation. Touch-panel can be operated properly.
7 . Interface connectors	
LAN	
USB-A (Master)	
Video output	(BNC type connector for video printer)
Remote signal	(for video printer)
8 . Power requirement	
AC 100 to 240 V	100 VA 50/60 Hz
9 . Dimensions and mass	
Dimensions	291 mm (W) × 495 mm (D) × 457 mm (H)
Mass (Weight)	20 kg

---

## 3.3 Standard Configuration

### 3.3.1 Standard accessories

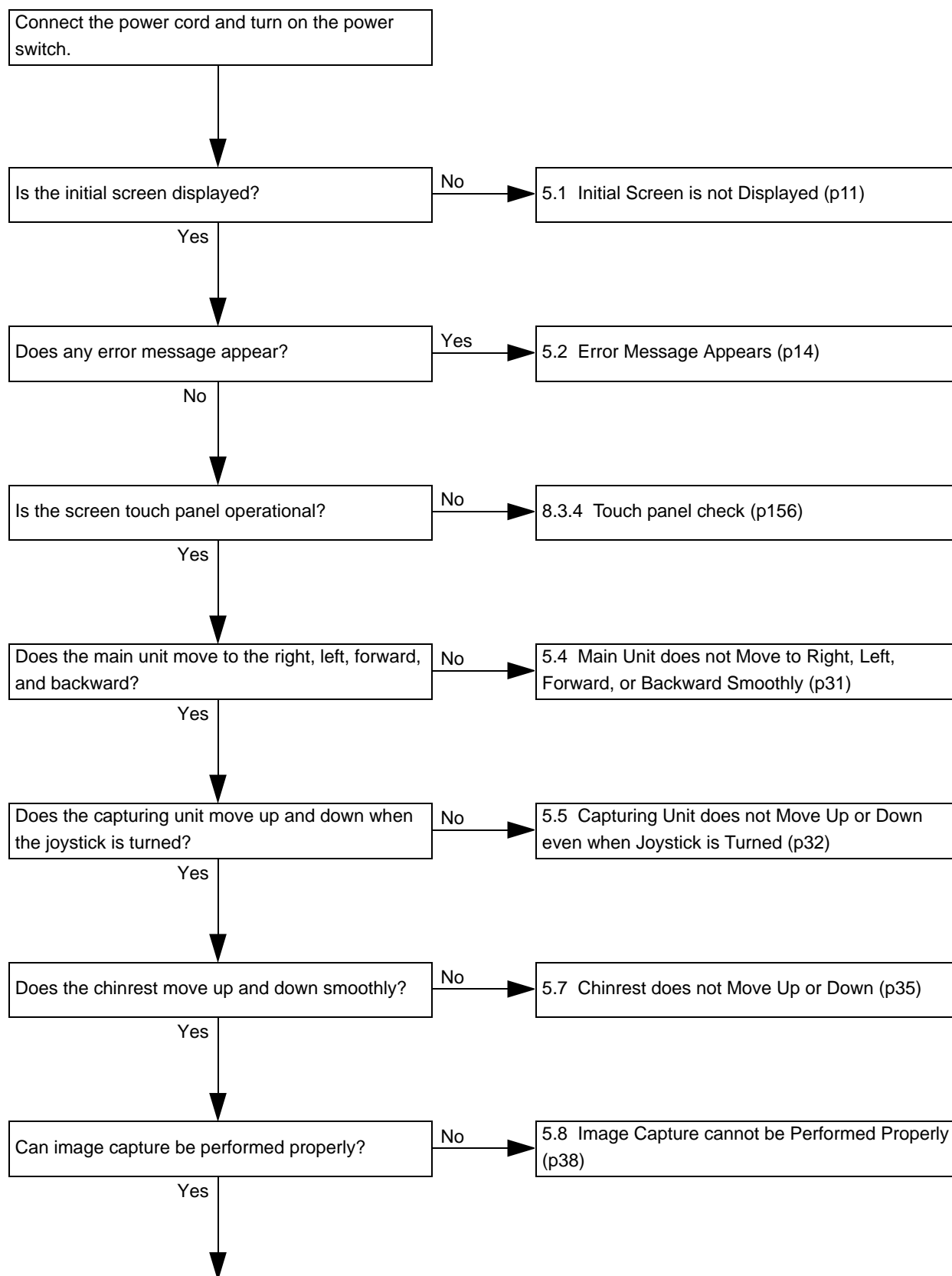
- |                             |          |
|-----------------------------|----------|
| 1 . Printer paper:          | 3 rolls  |
| 2 . Power cord:             | 1 unit   |
| 3 . Dust cover:             | 1 unit   |
| 4 . Chinrest paper:         | 1 pack   |
| 5 . Chinrest pin:           | 2 units  |
| 6 . Operator's Manual:      | 1 volume |
| 7 . Touch-screen pen:       | 1 unit   |
| 8 . Touch-screen pen stand: | 1 unit   |

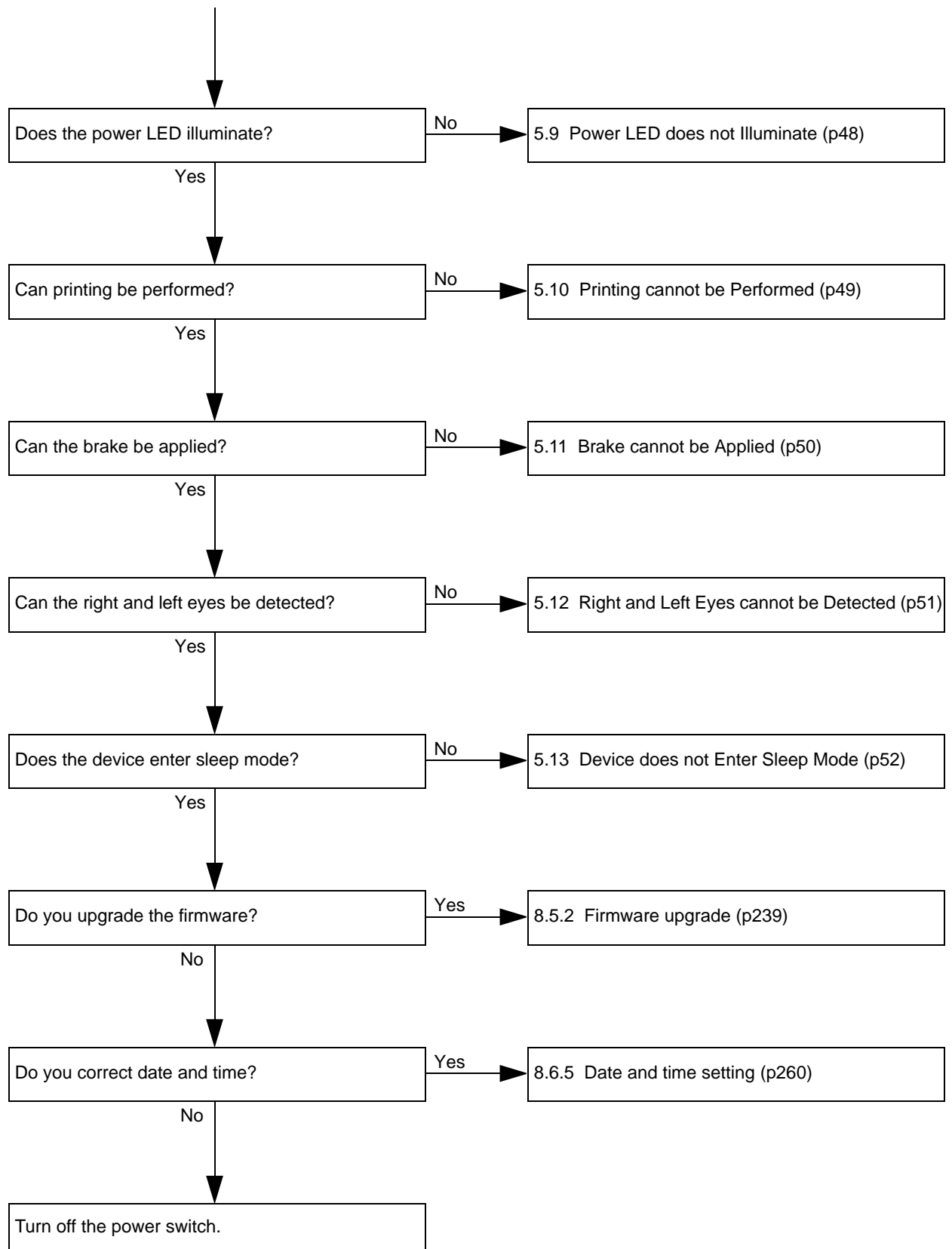
### 3.3.2 Optional accessories

- 1 . Video printer (B/W)
- 2 . Video printer paper (thermal paper roll)
- 3 . Magnetic card reader (USB)
- 4 . Barcode reader (USB)

This page is intentionally left blank.

## 4 TROUBLESHOOTING

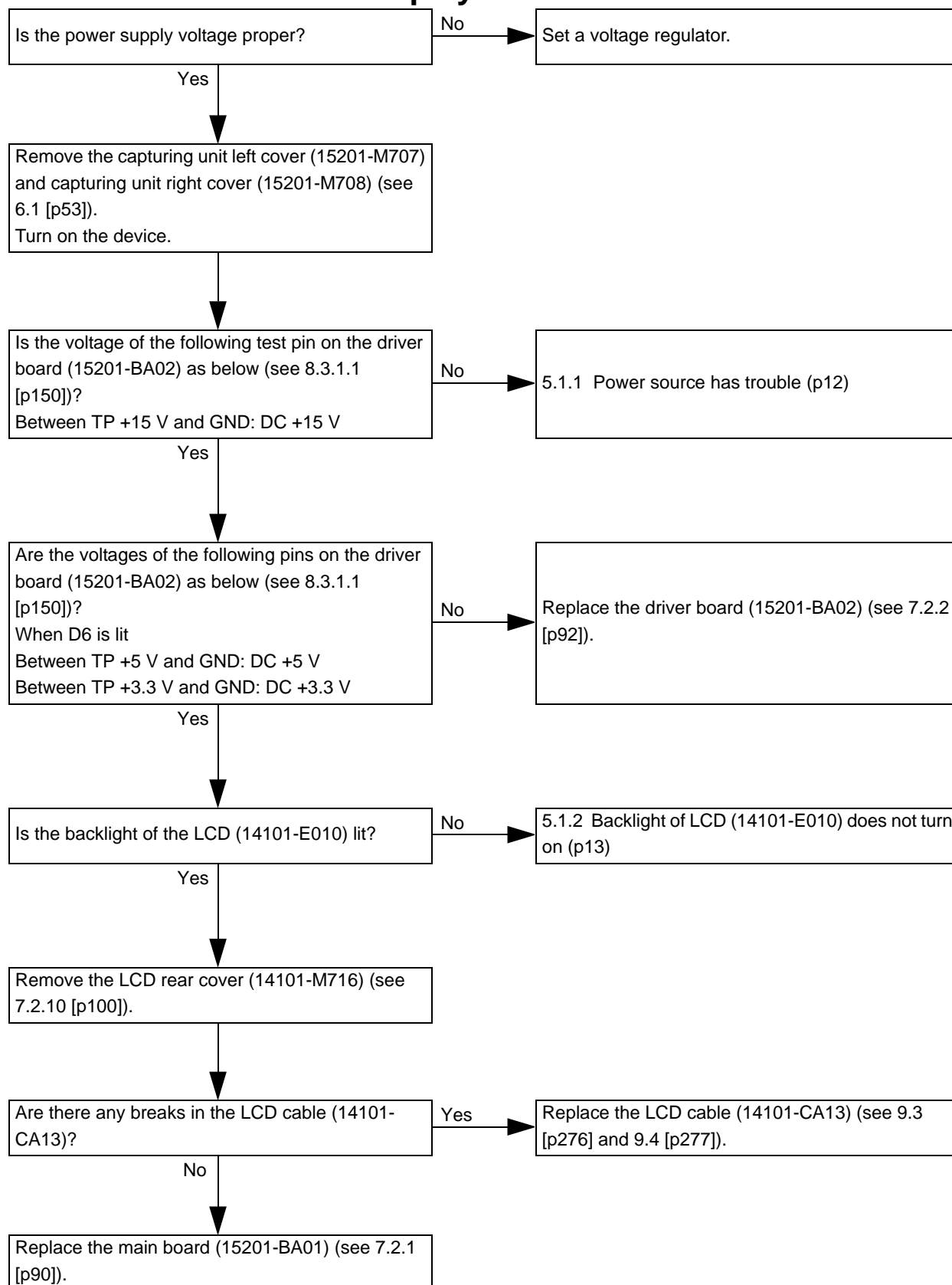




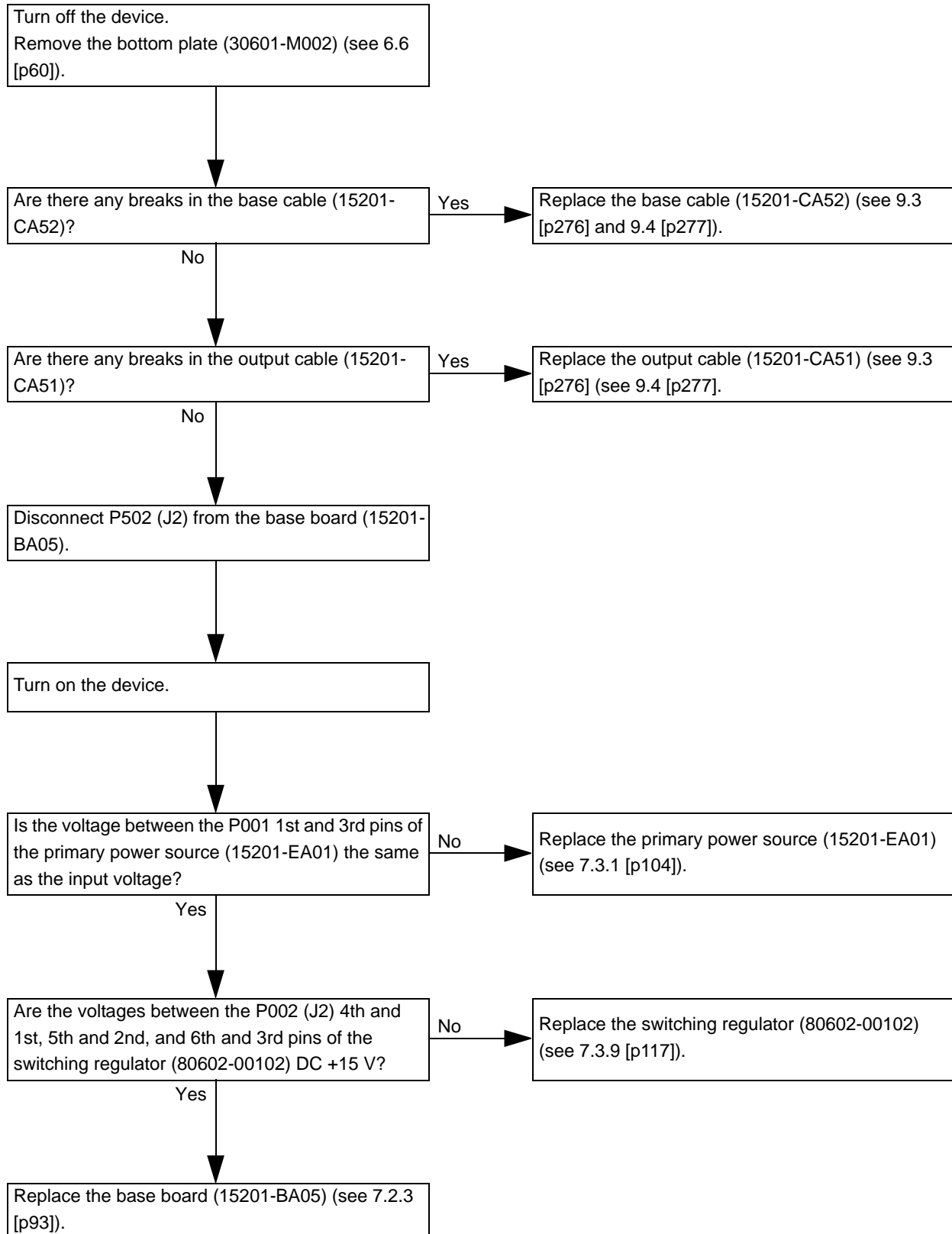


## 5 SUBTROUBLESHOOTING

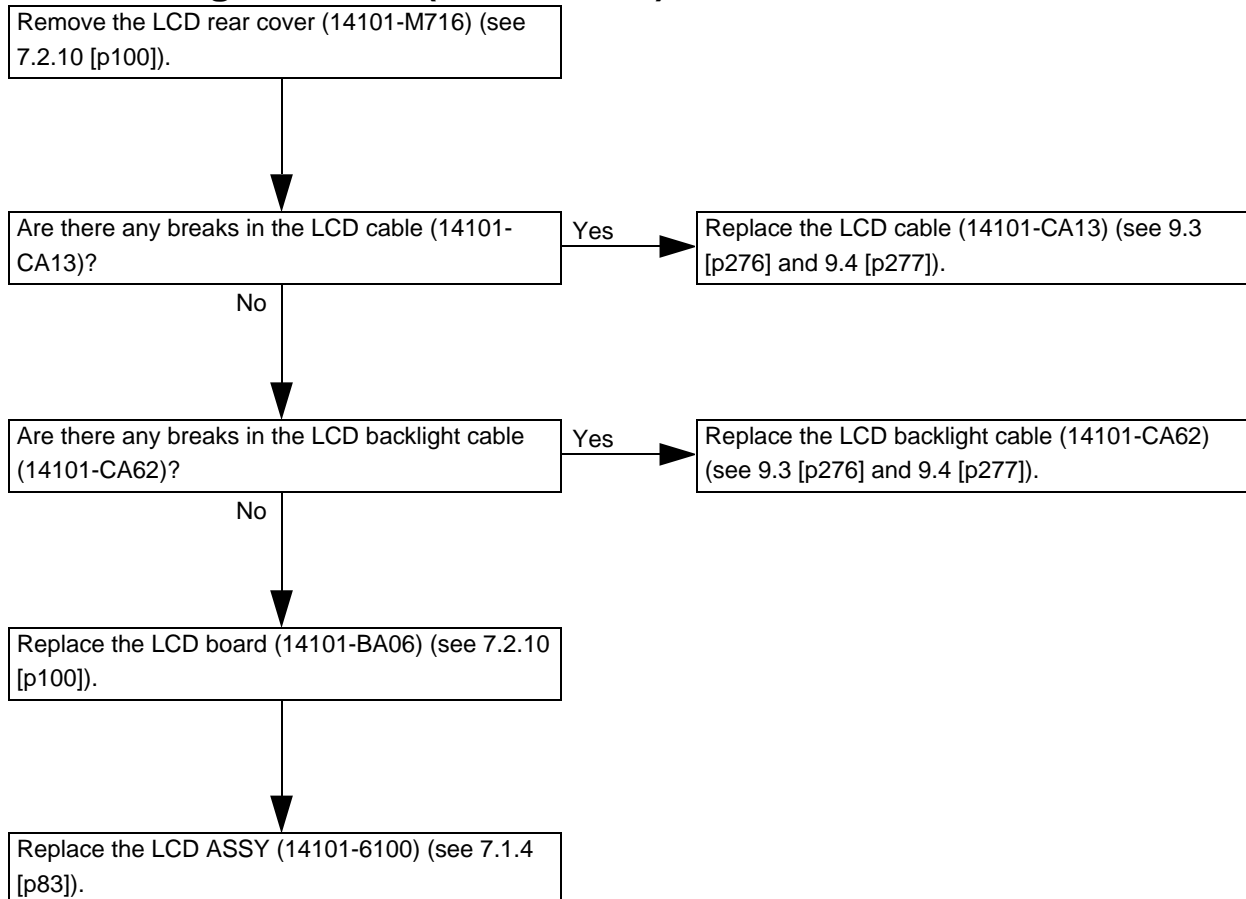
### 5.1 Initial Screen is not Displayed



### 5.1.1 Power source has trouble

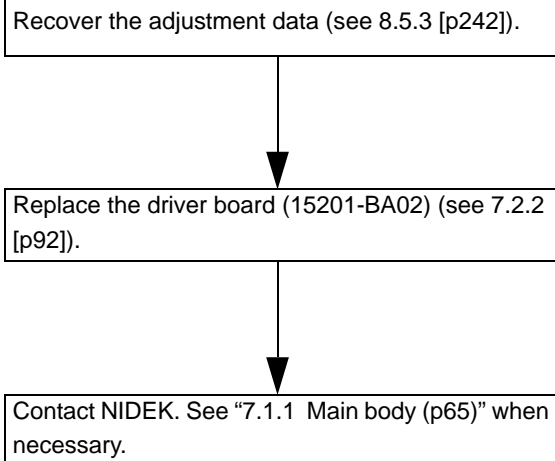


## 5.1.2 Backlight of LCD (14101-E010) does not turn on

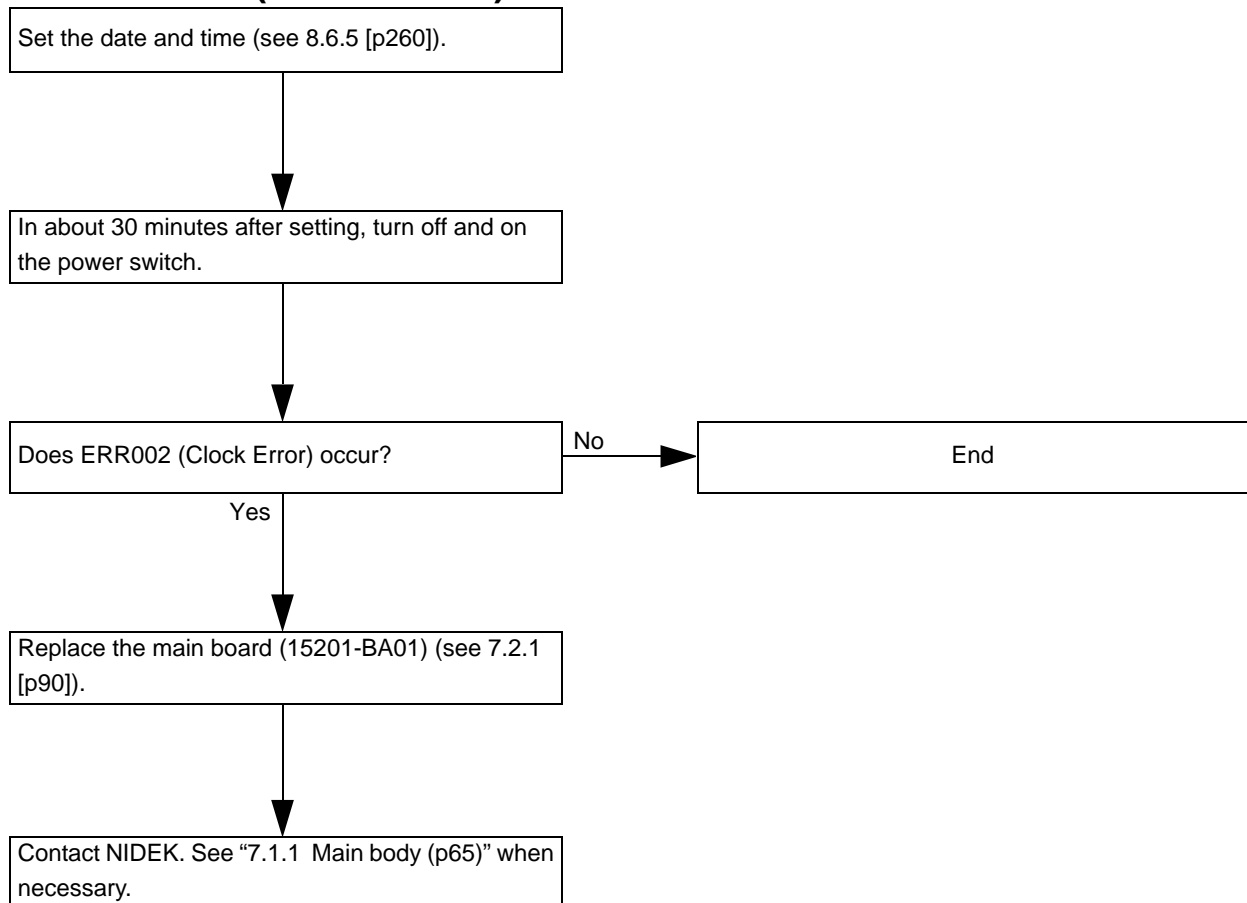


## 5.2 Error Message Appears

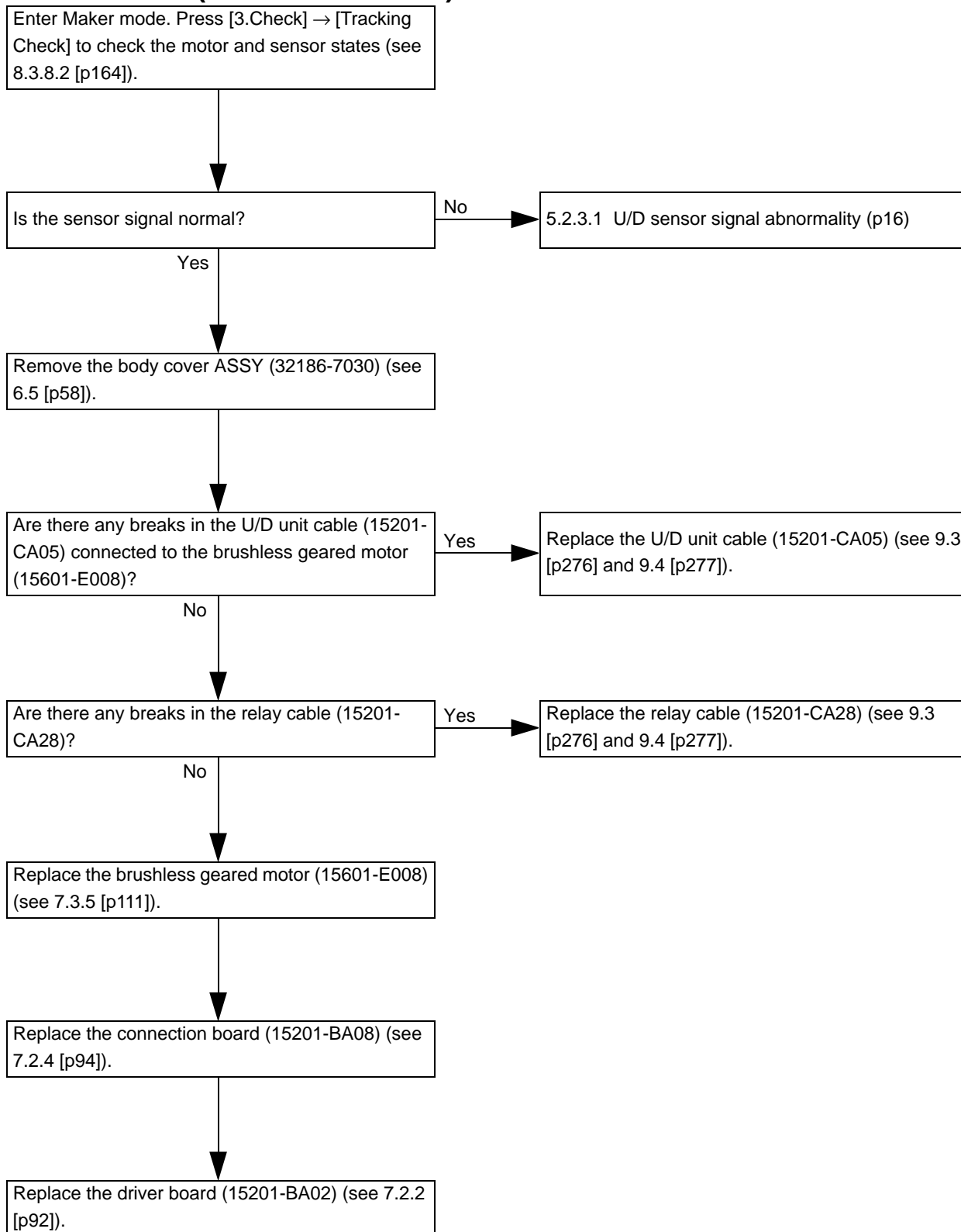
### 5.2.1 ERR001 (EEPROM Error.)



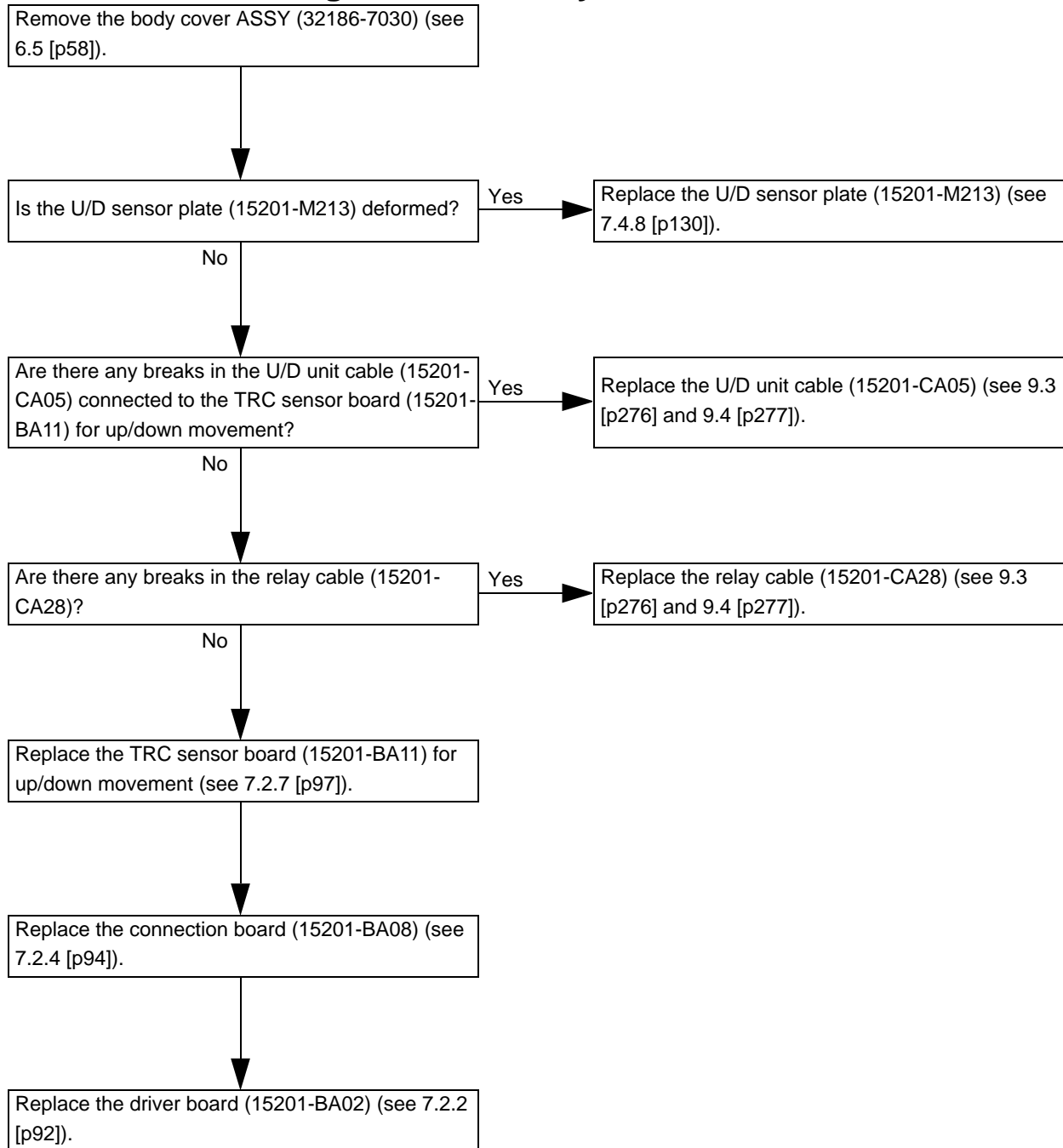
### 5.2.2 ERR002 (Clock Error.)



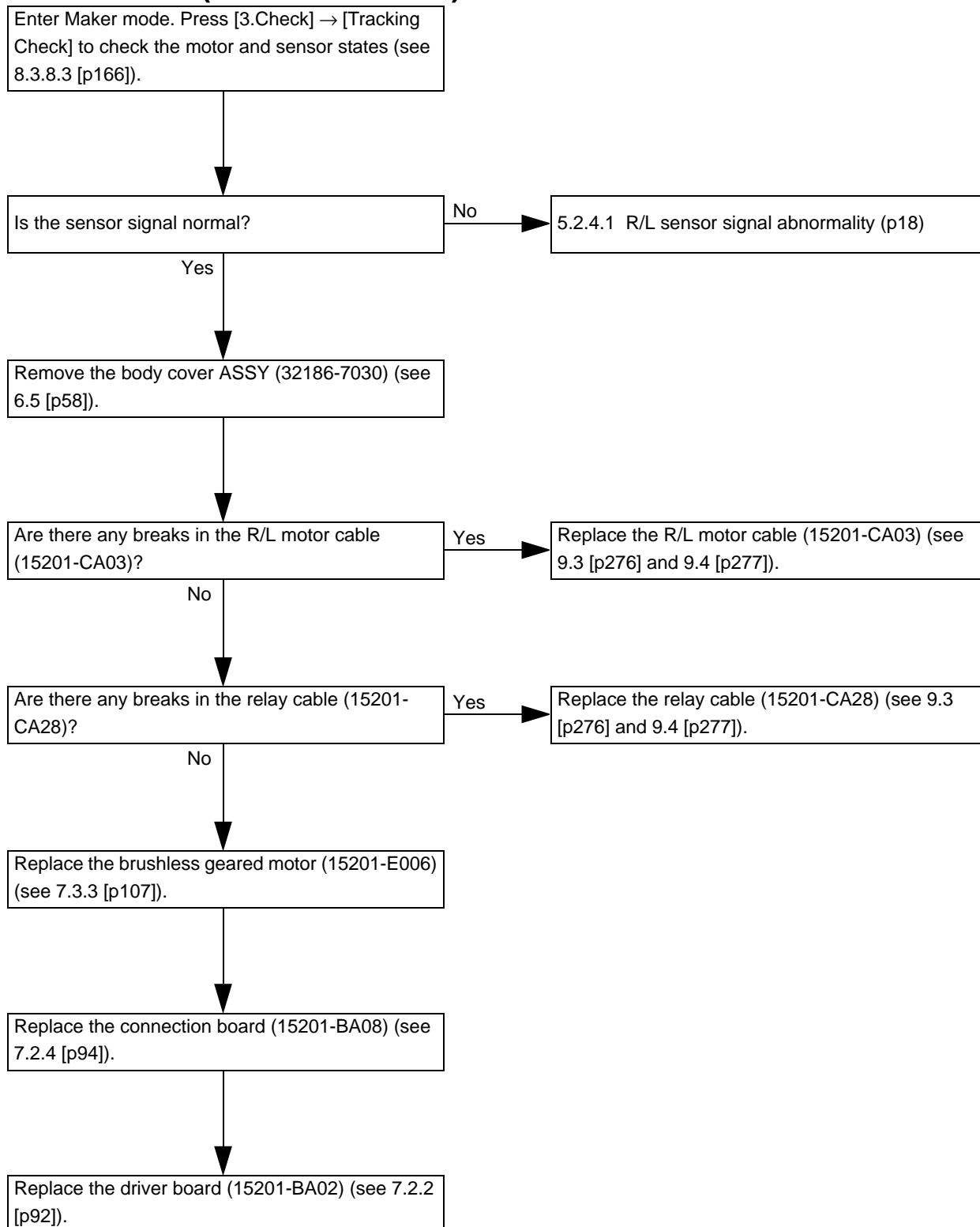
## 5.2.3 ERR031 (U/D Motor Error.)



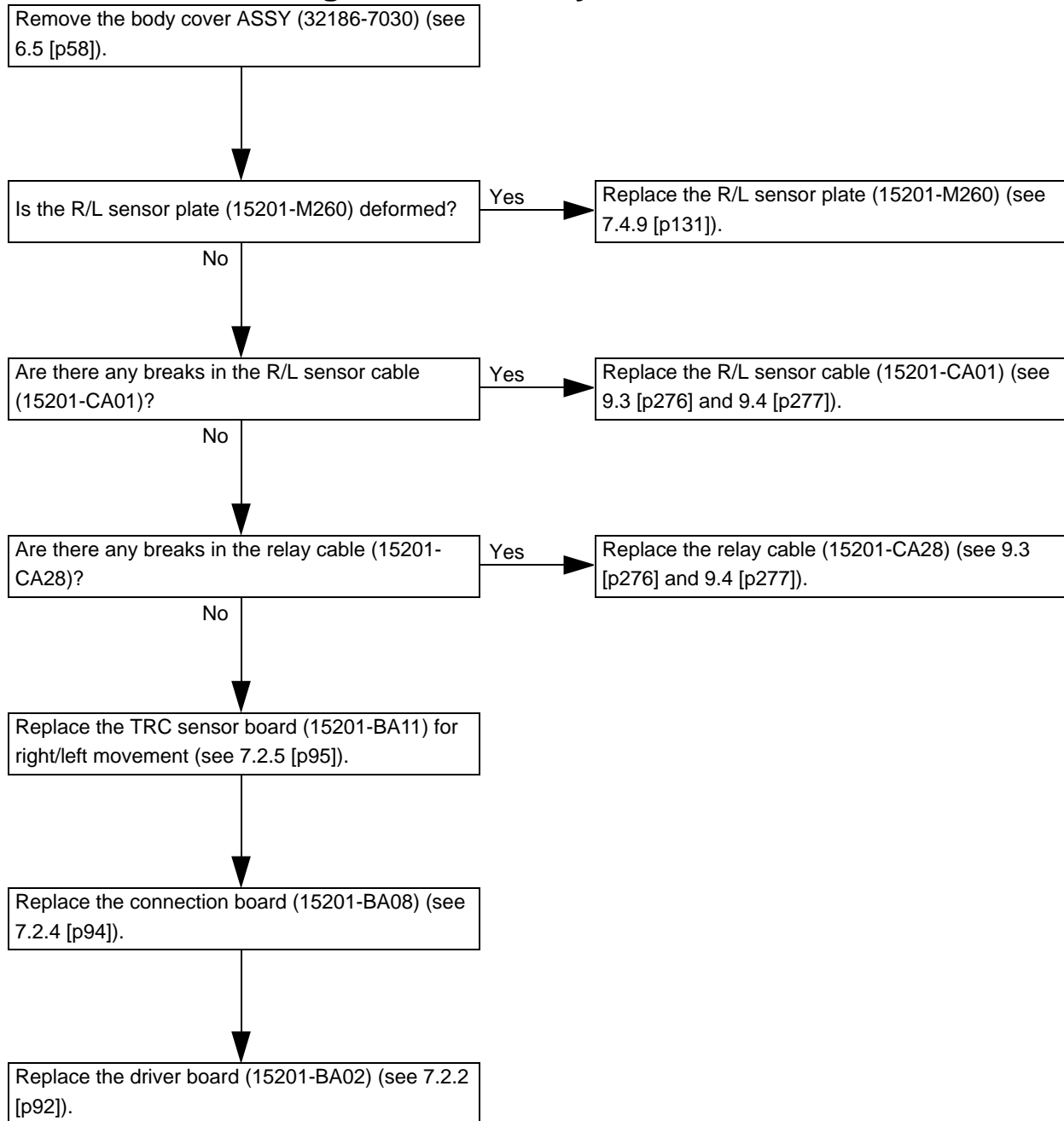
### 5.2.3.1 U/D sensor signal abnormality



## 5.2.4 ERR032 (R/L Motor Error.)

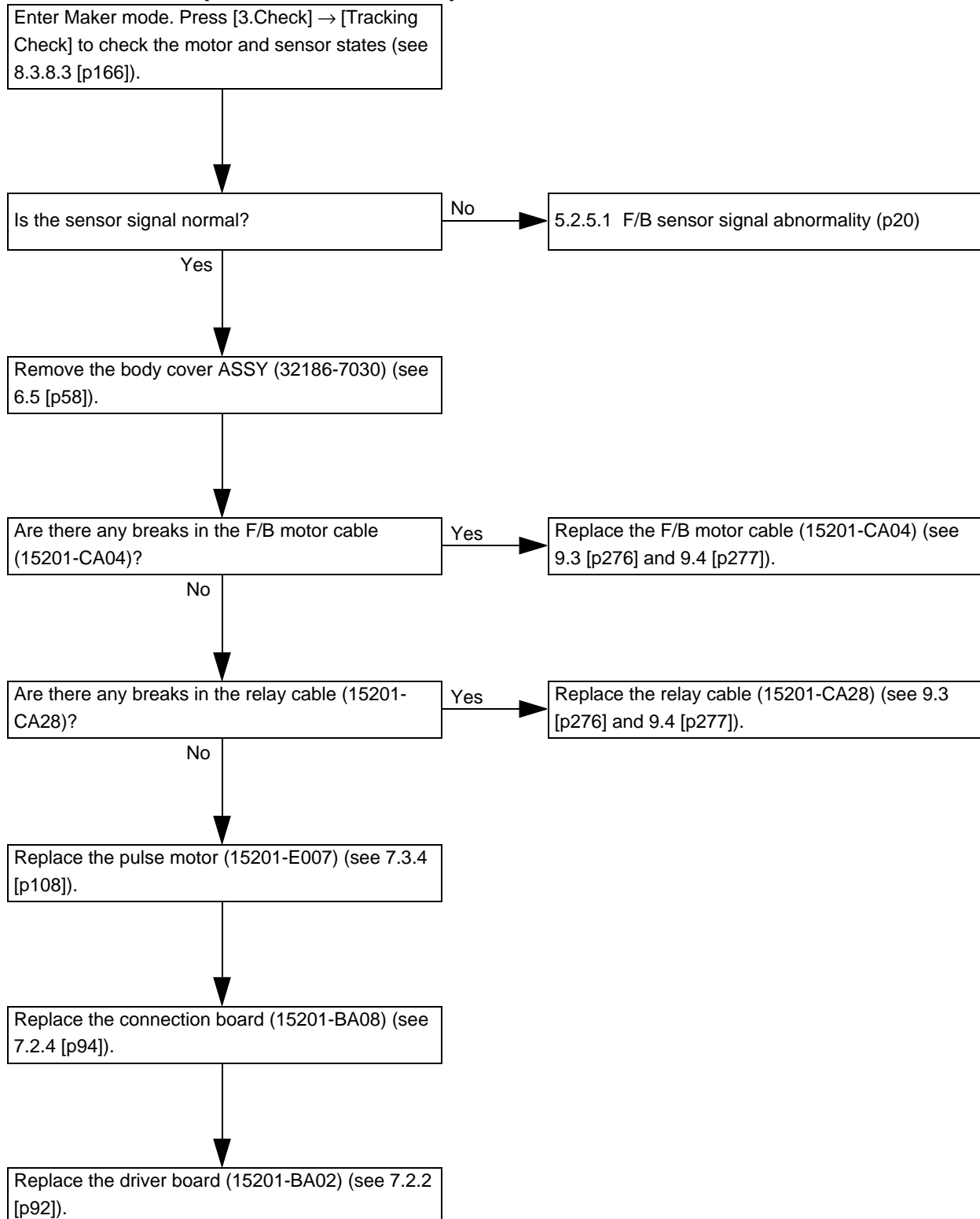


### 5.2.4.1 R/L sensor signal abnormality

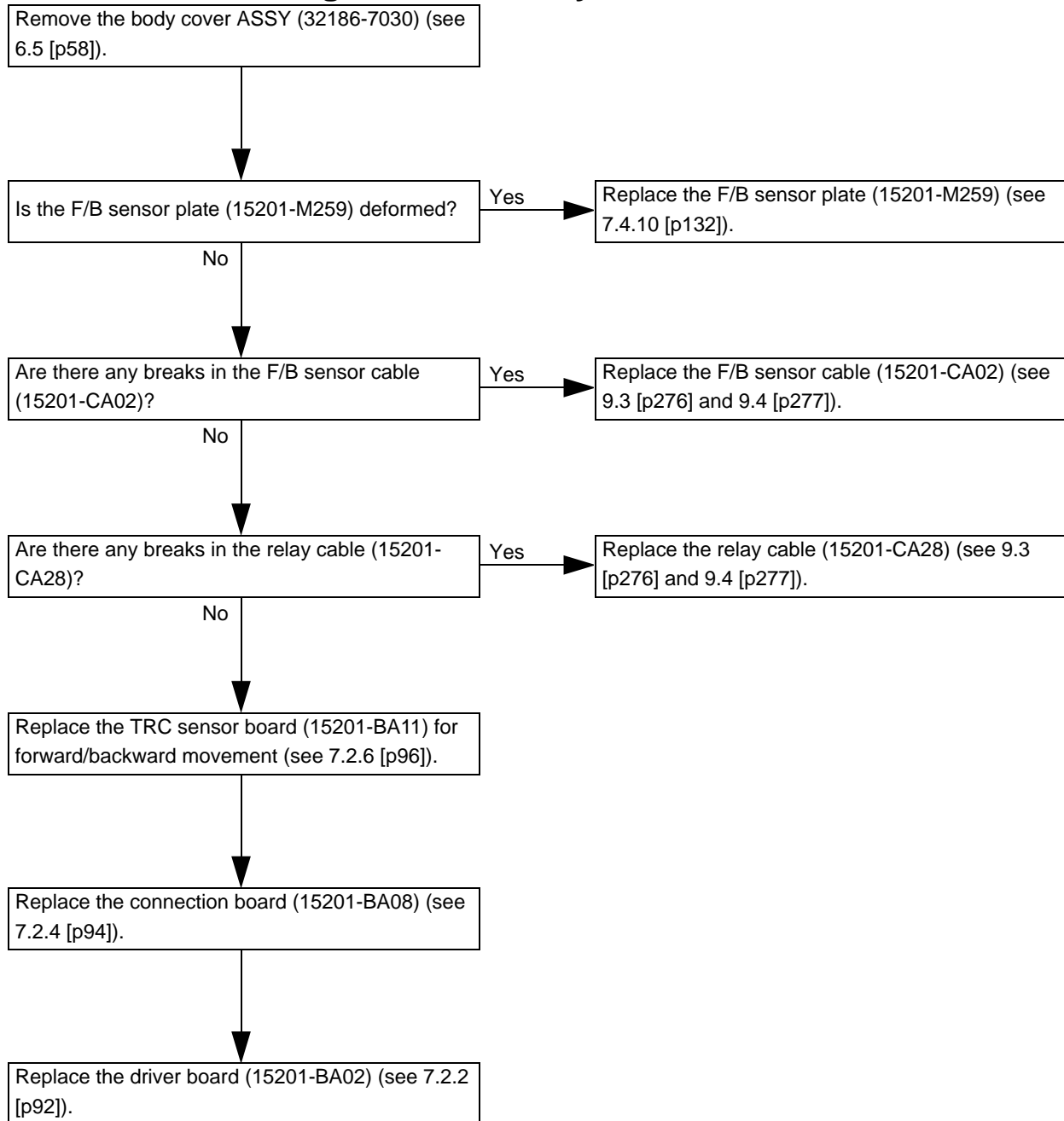




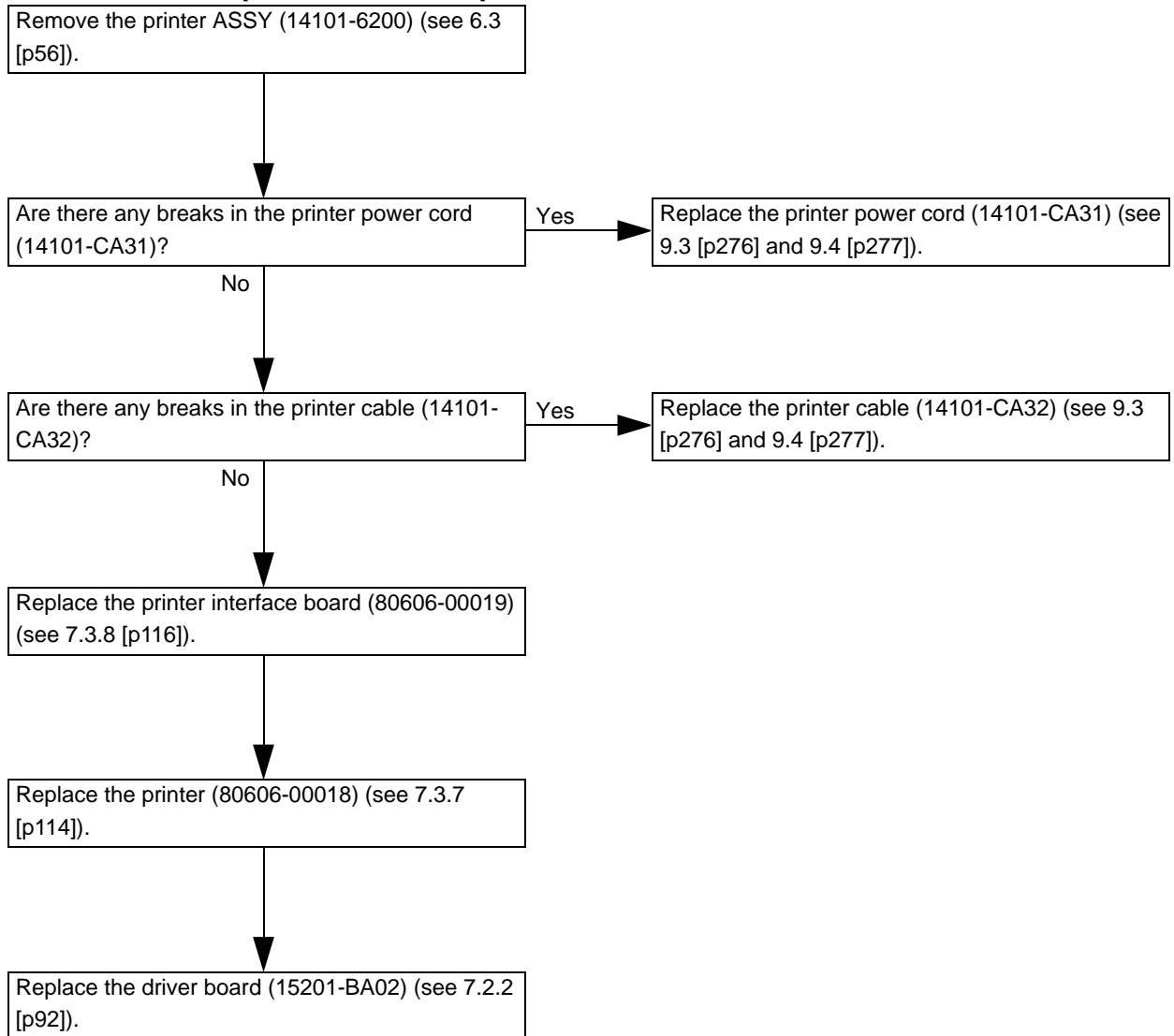
## 5.2.5 ERR033 (F/B Motor Error.)



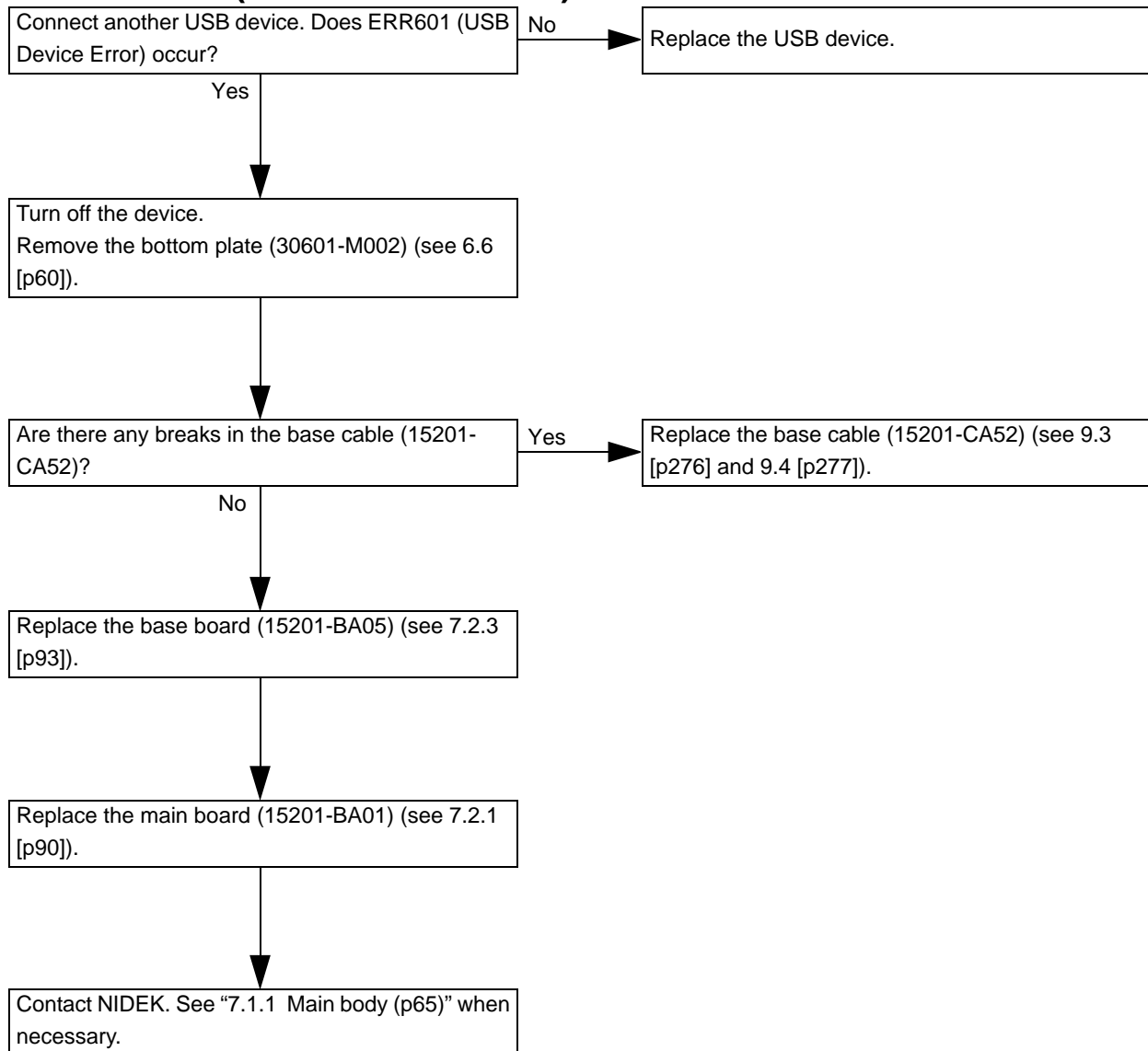
### 5.2.5.1 F/B sensor signal abnormality



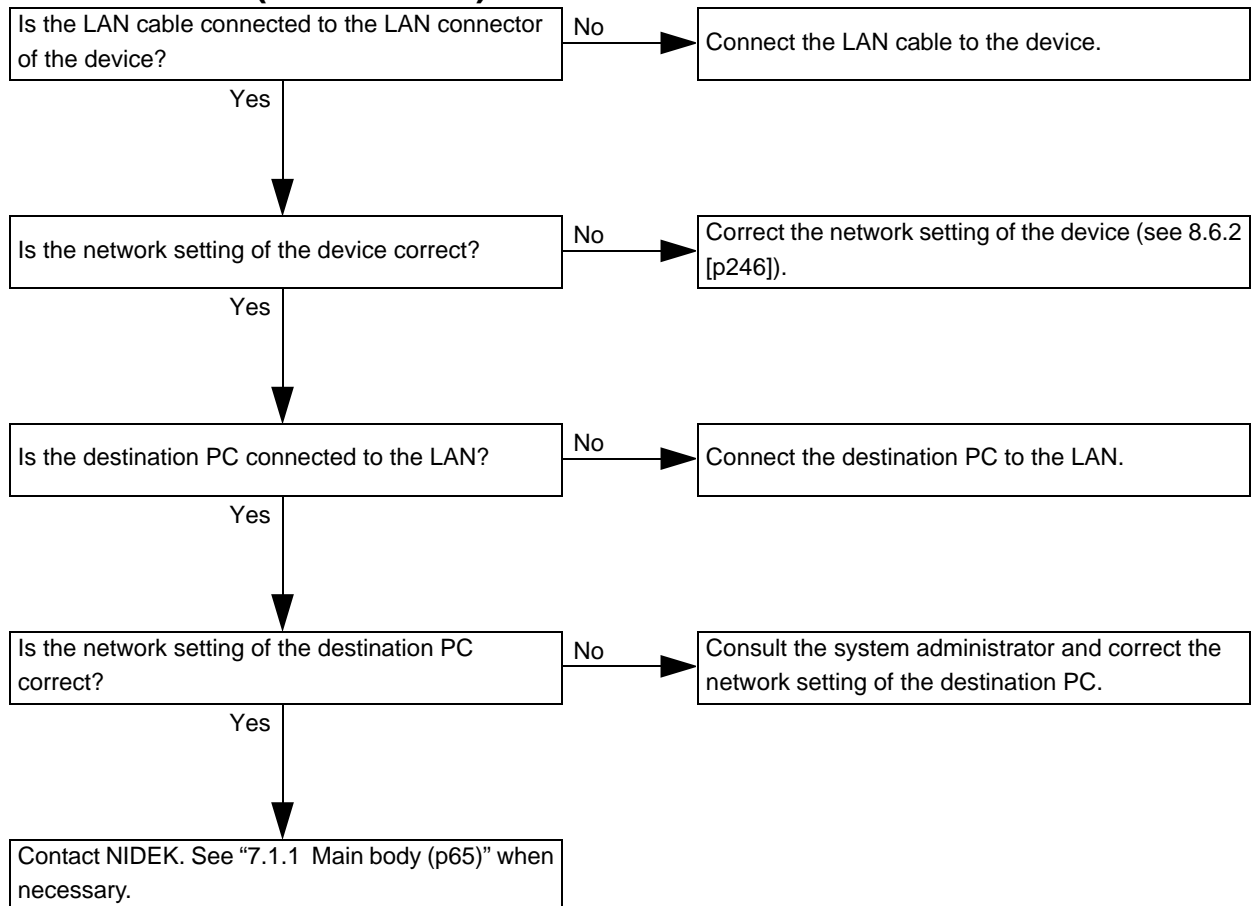
## 5.2.6 ERR043 (Printer Error.)



## 5.2.7 ERR601 (USB Device Error.)

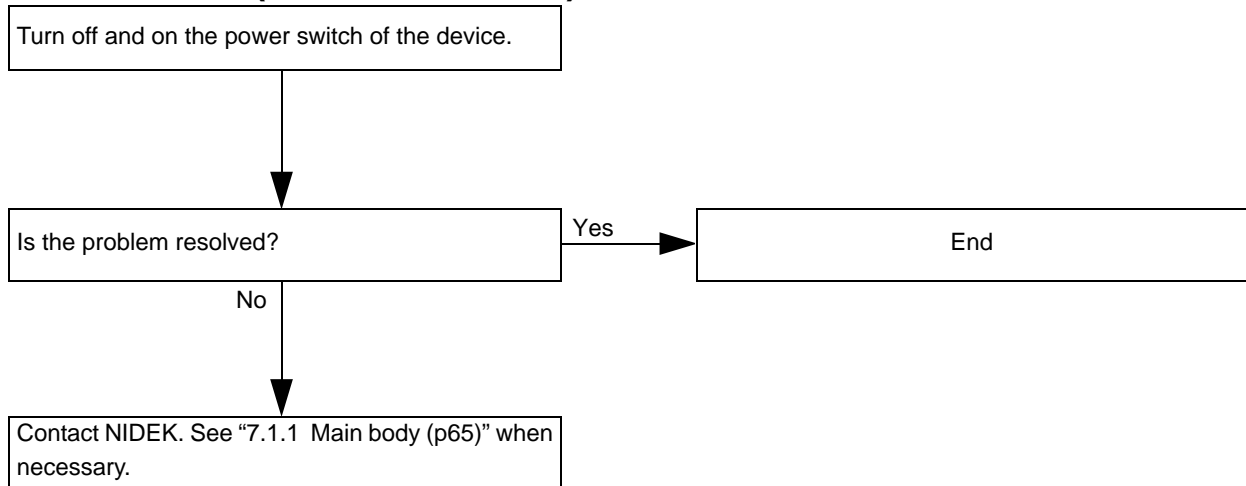


## 5.2.8 ERR700 (CIFS Error.)



---

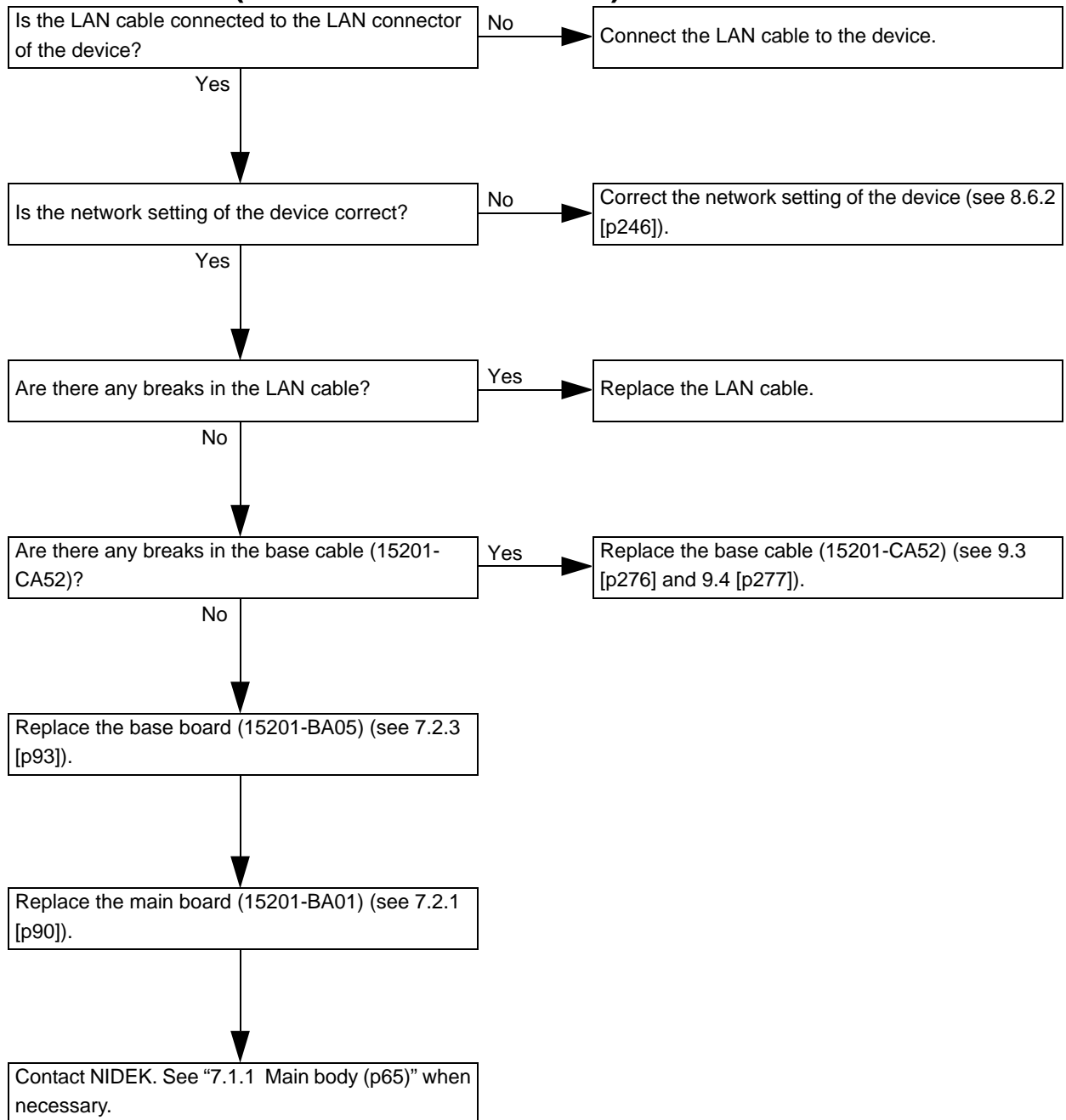
## 5.2.9 ERR703 (Hardware Error.)



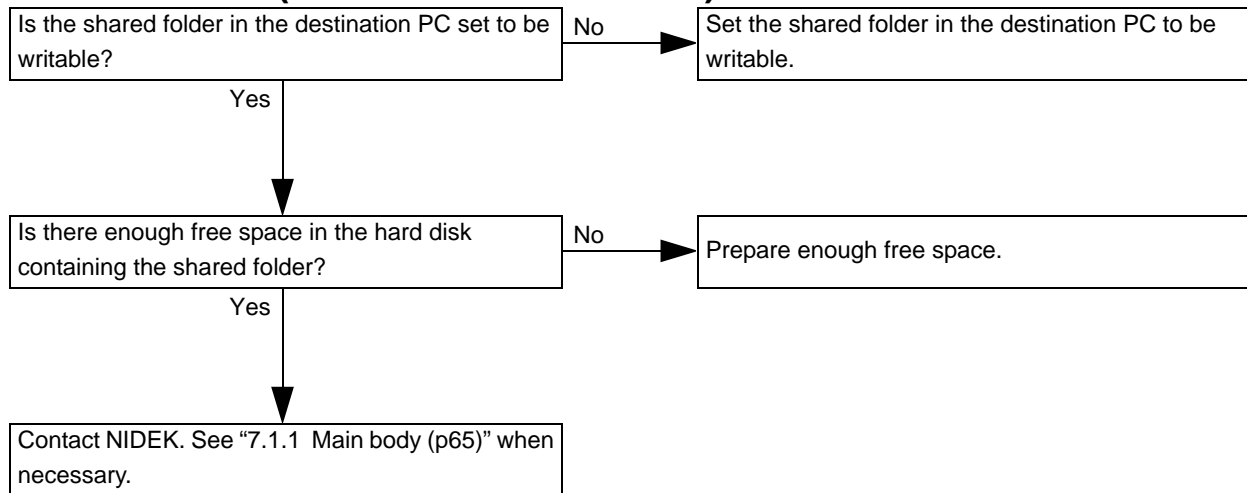
### 5.2.10 ERR704 (DHCP Error.)

- 1 . The DHCP server may not operate properly. Contact NIDEK.
- 2 . Set the DHCP to OFF and set the IP address and subnet mask (see 8.6.2.2 [p247]).

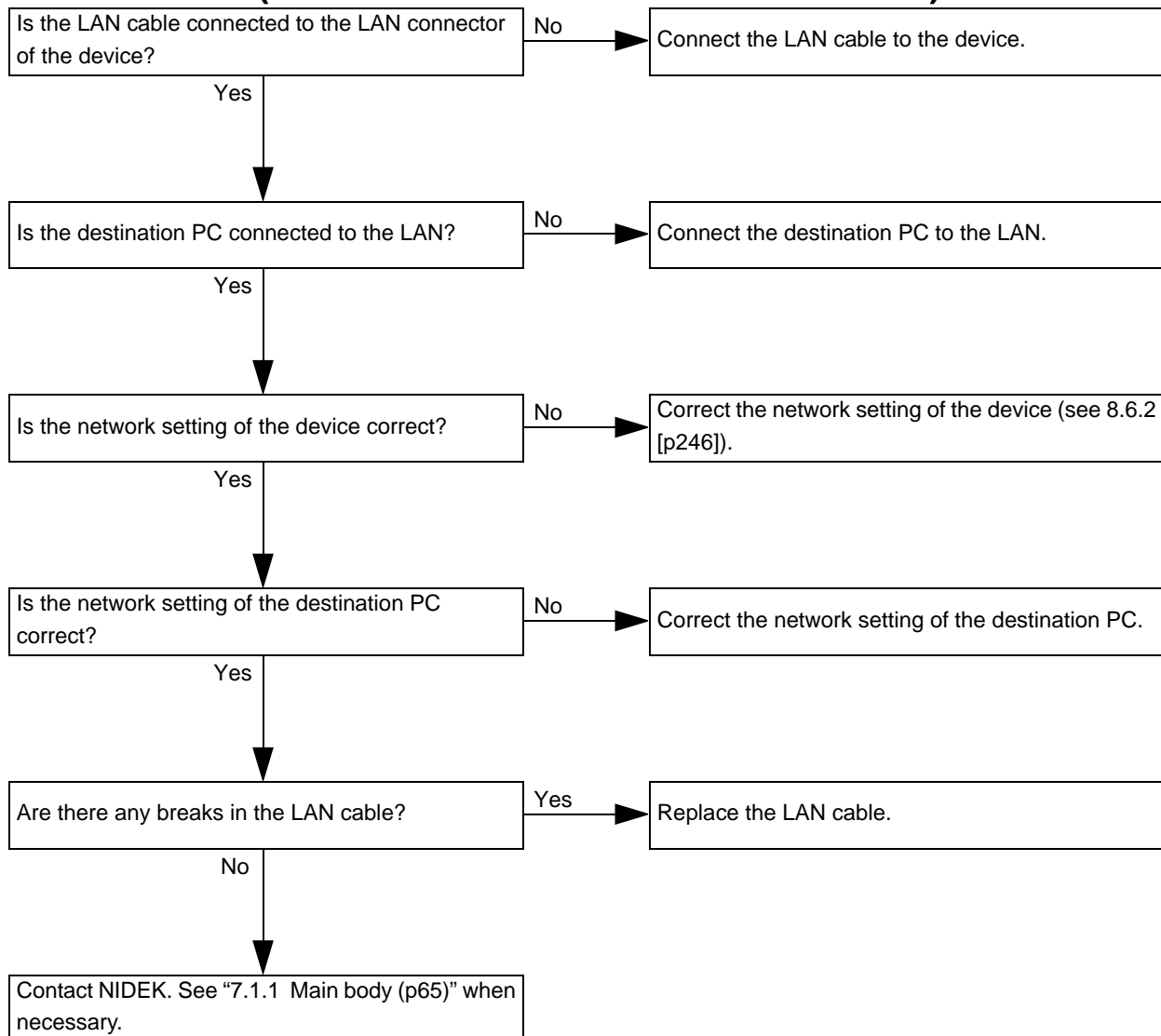
## 5.2.11 ERR750 (Can't Access Network.)



### 5.2.12 ERR751 (Can't Write File in PC.)

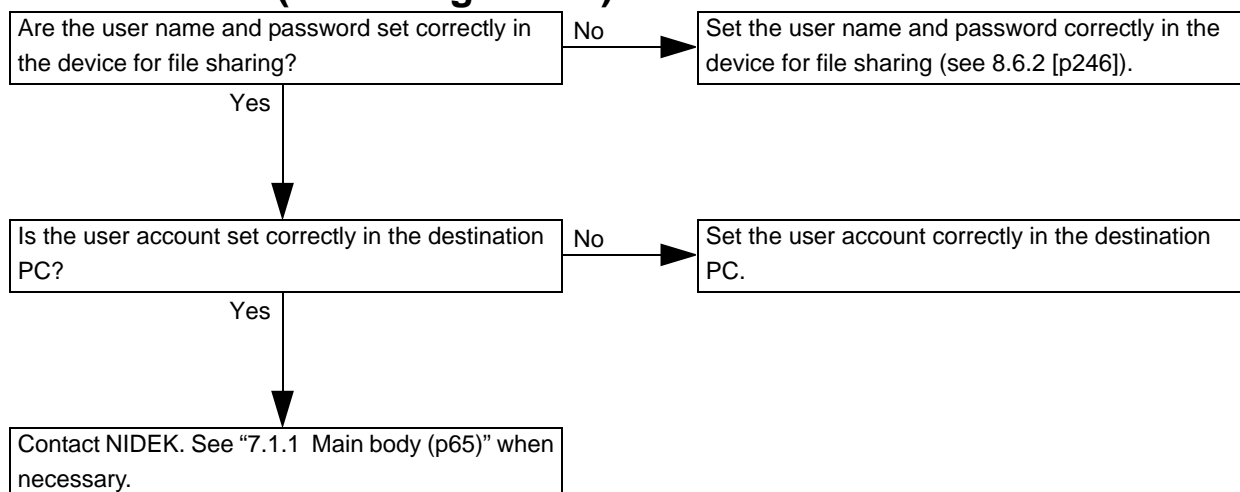


### 5.2.13 ERR754 (There is no PC Name in this Network.)

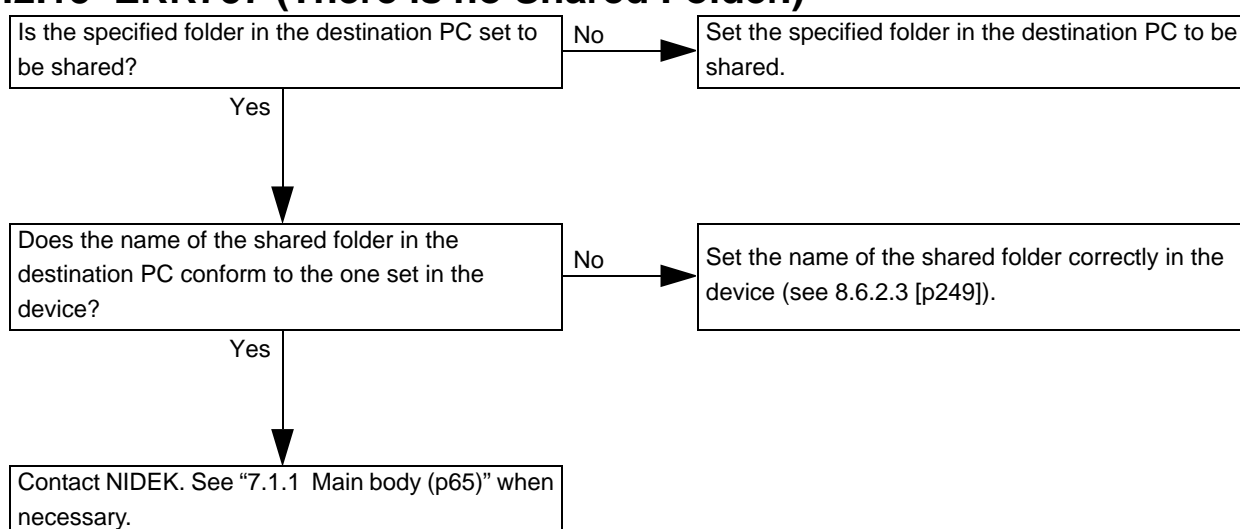




### 5.2.14 ERR756 (Can't Logon PC.)



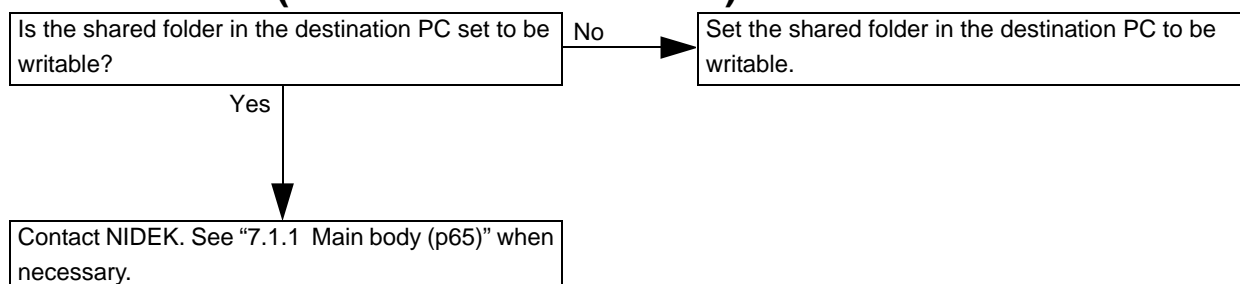
### 5.2.15 ERR757 (There is no Shared Folder.)



### 5.2.16 ERR758 (Network Timeout)

Perform the procedure as in "5.2.8 ERR700 (CIFS Error.)" (p23).

### 5.2.17 ERR759 (Can't Delete File in PC.)



### 5.2.18 ERR760 (Network Initializing. Please retry.)

- 1 . Perform the procedure as in "5.2.8 ERR700 (CIFS Error.)" (p23).
- 2 . If the problem is not resolved even after several retries, contact NIDEK.

### **5.2.19 ERR761 (Access Denied.)**

Perform the procedure as in “5.2.14 ERR756 (Can’t Logon PC.)” (p27).

### **5.2.20 ERR762 (Account Disabled.)**

Perform the procedure as in “5.2.14 ERR756 (Can’t Logon PC.)” (p27).

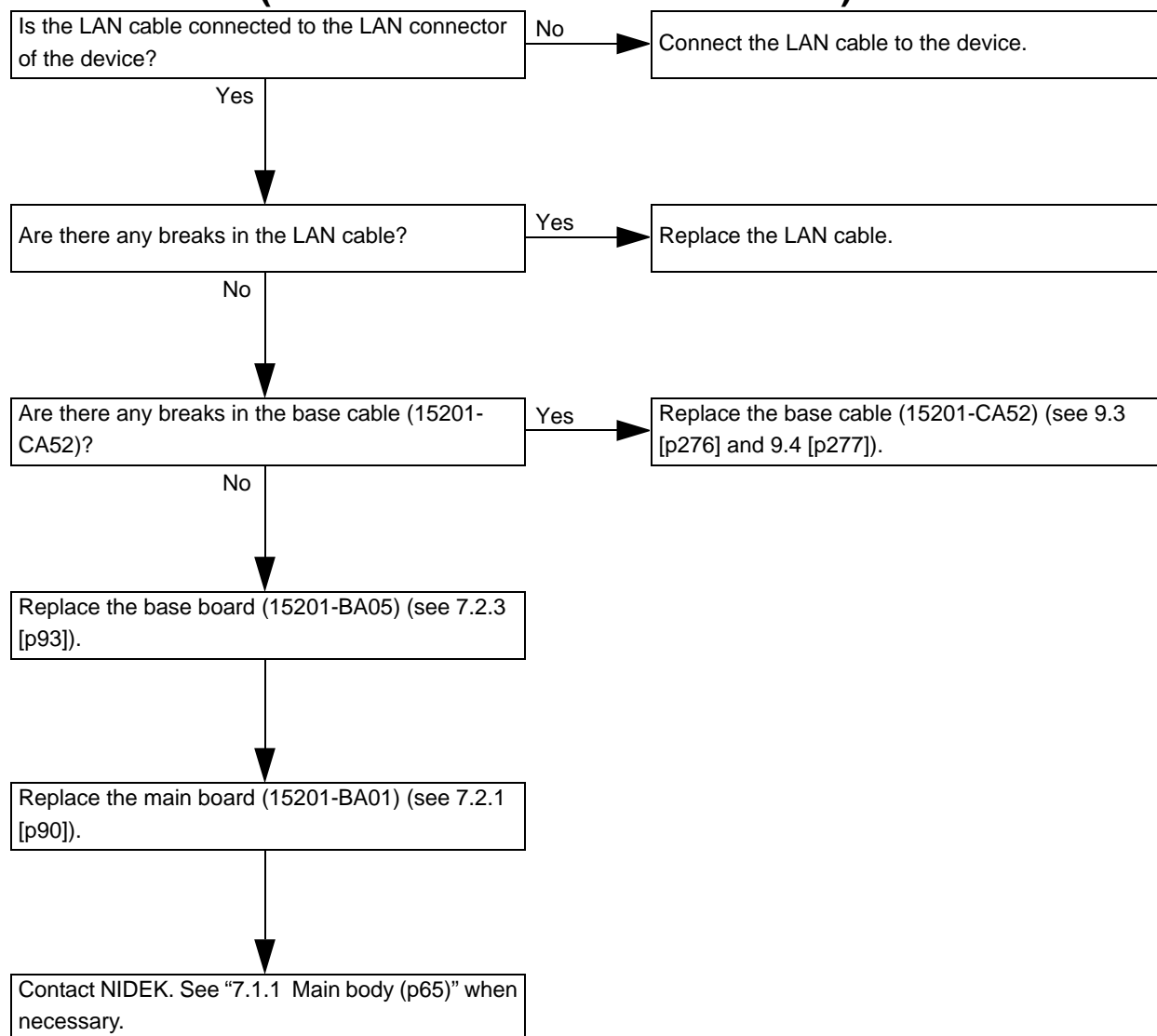
### **5.2.21 ERR763 (Can’t Read File in PC.)**

Perform the procedure as in “5.2.14 ERR756 (Can’t Logon PC.)” (p27).

### **5.2.22 ERR766 (File Name is same. Can’t Write File in PC.)**

Perform the procedure as in “5.2.8 ERR700 (CIFS Error.)” (p23).

### 5.2.23 ERR771 (Network cable is not connected.)

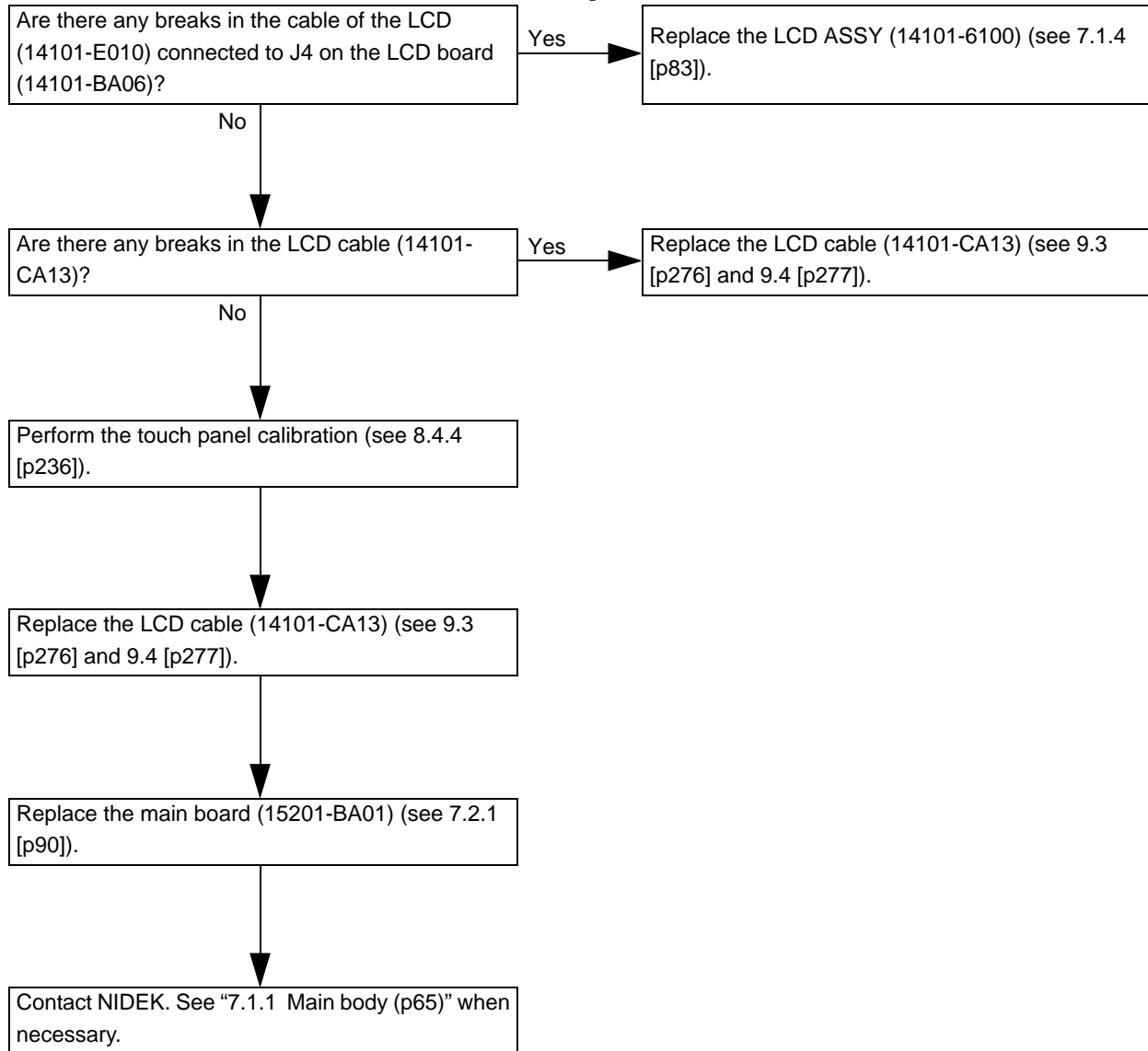


### 5.2.24 ERR772 (There is no response.)

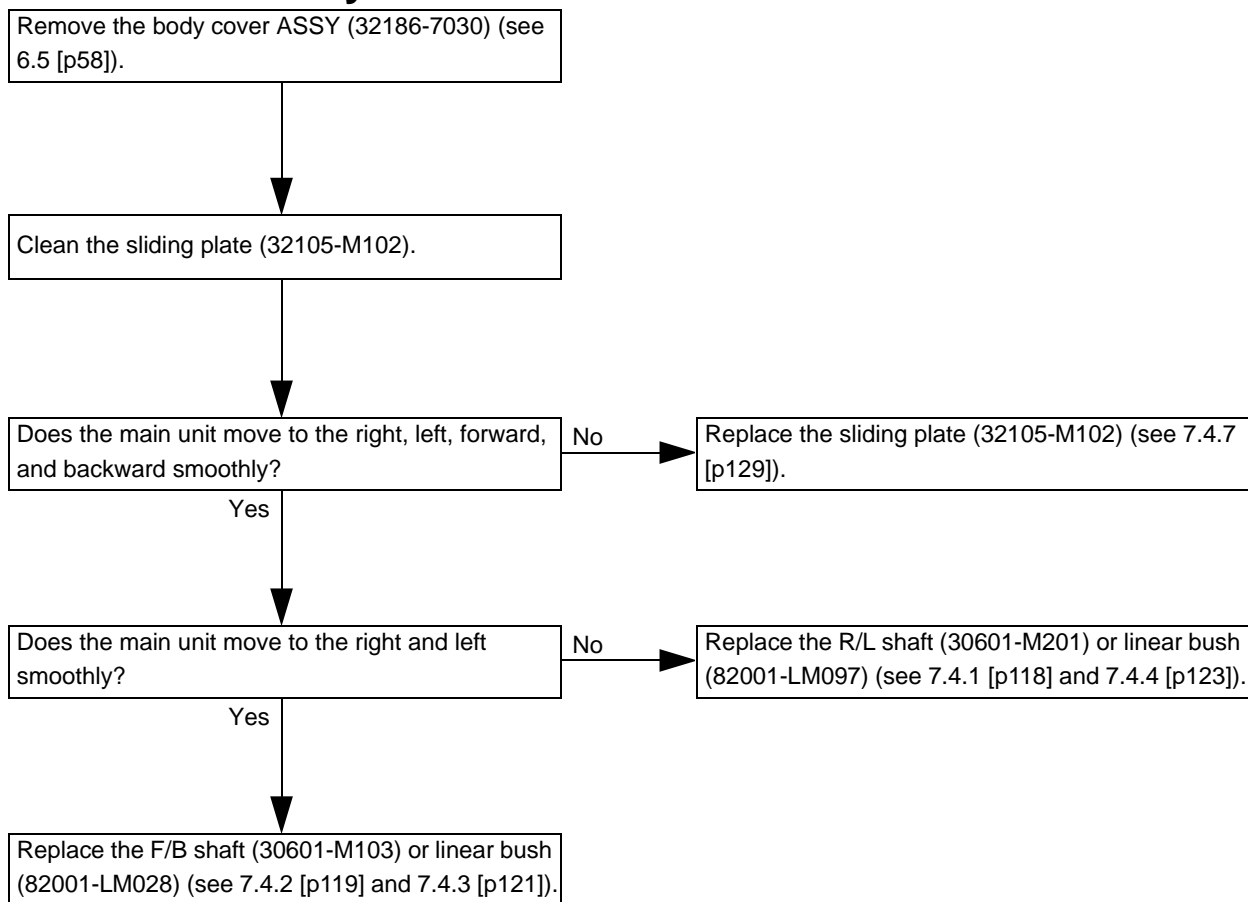
The image filing software (NAVIS) on the PC could not delete data within the set time for timeout.

Change the setting of the image filing software (NAVIS-Lite) on the PC from "ACK" to "ON".

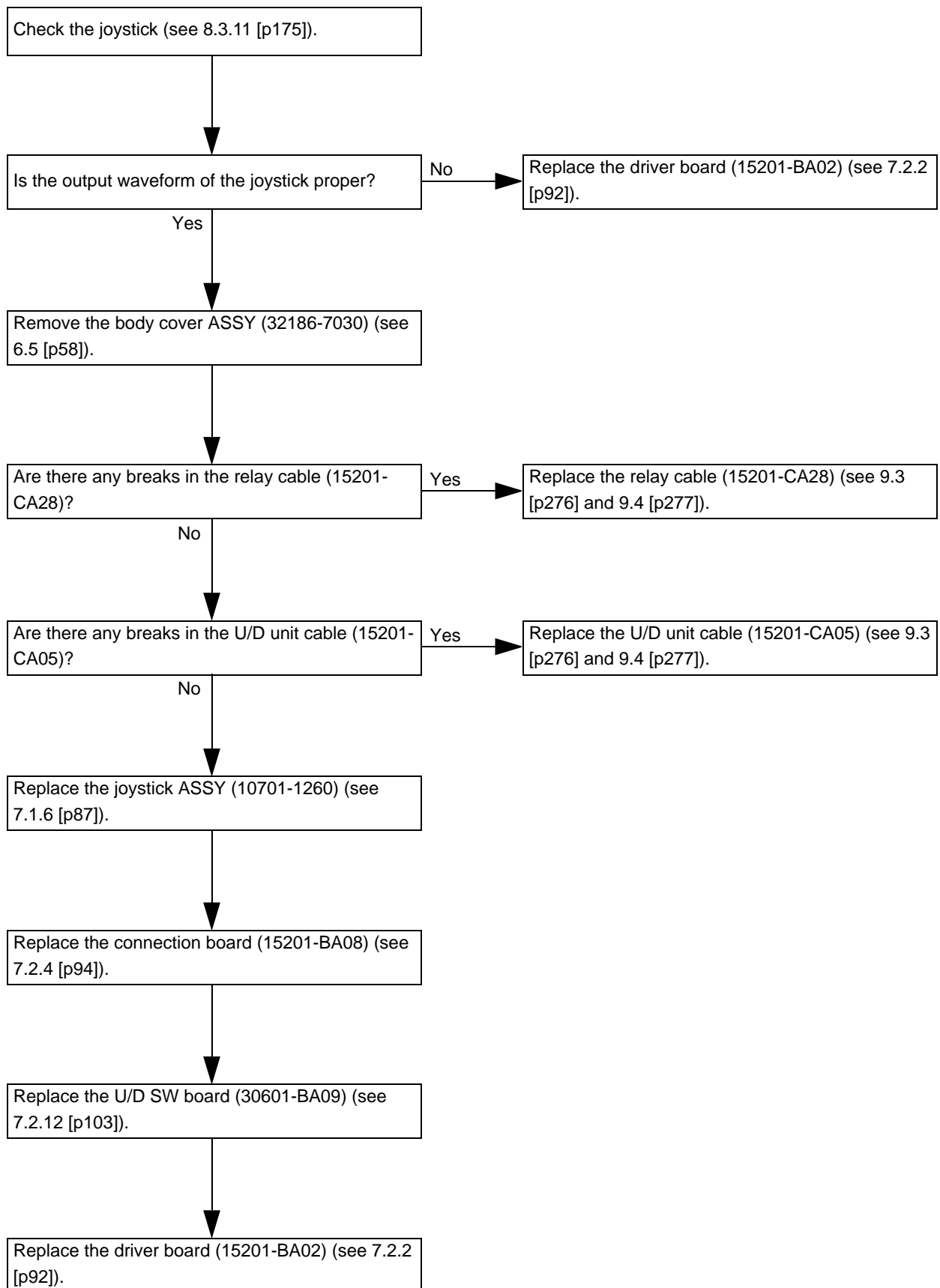
## 5.3 Screen Touch Panel is not Operational



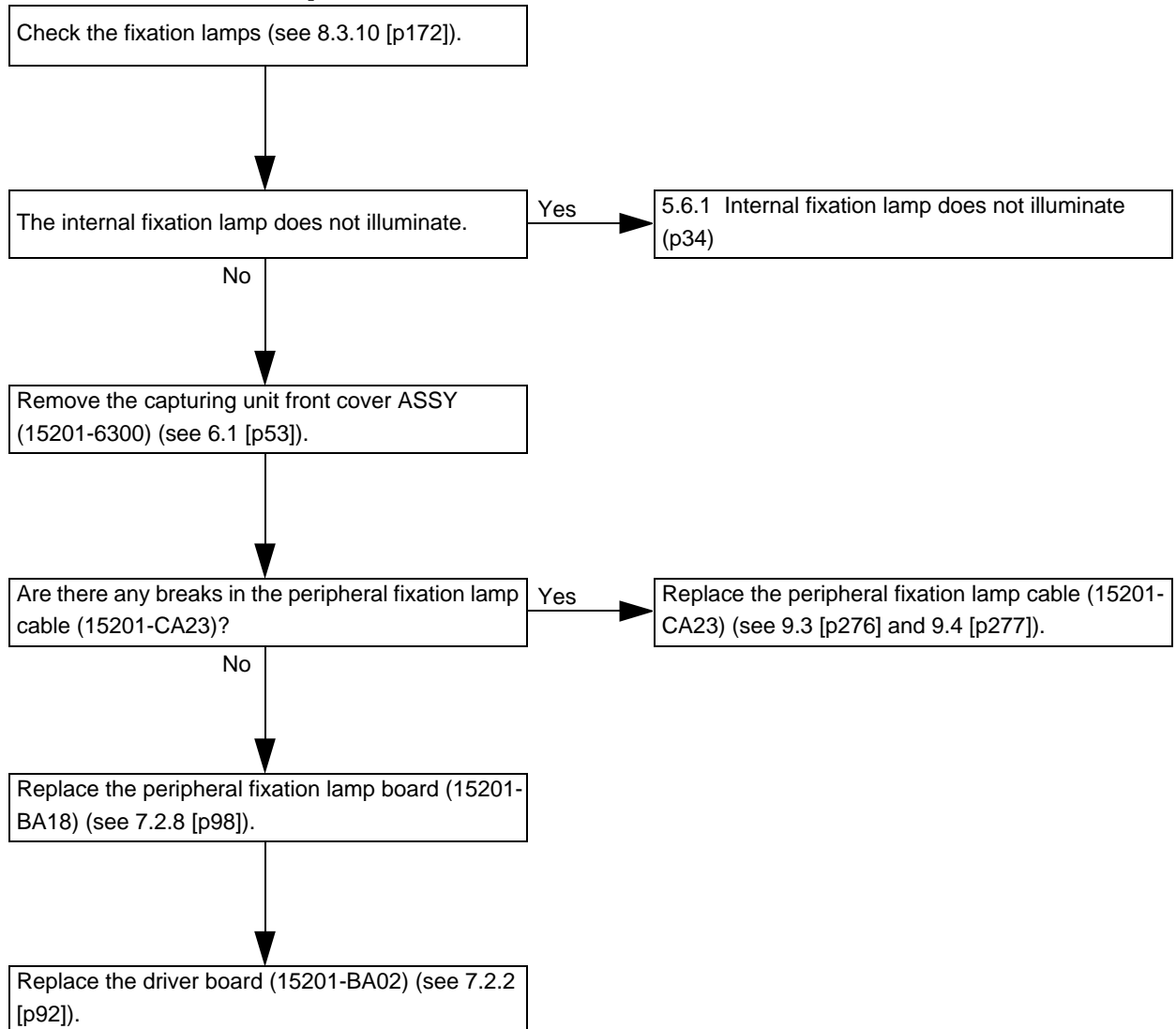
## 5.4 Main Unit does not Move to Right, Left, Forward, or Backward Smoothly



## 5.5 Capturing Unit does not Move Up or Down even when Joystick is Turned



## 5.6 Fixation Lamp does not Illuminate



---

## 5.6.1 Internal fixation lamp does not illuminate

Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

Are there any breaks in the fixation lamp cable (15201-CA22)?

Yes

Replace the fixation lamp cable (15201-CA22) (see 9.3 [p276] and 9.4 [p277]).

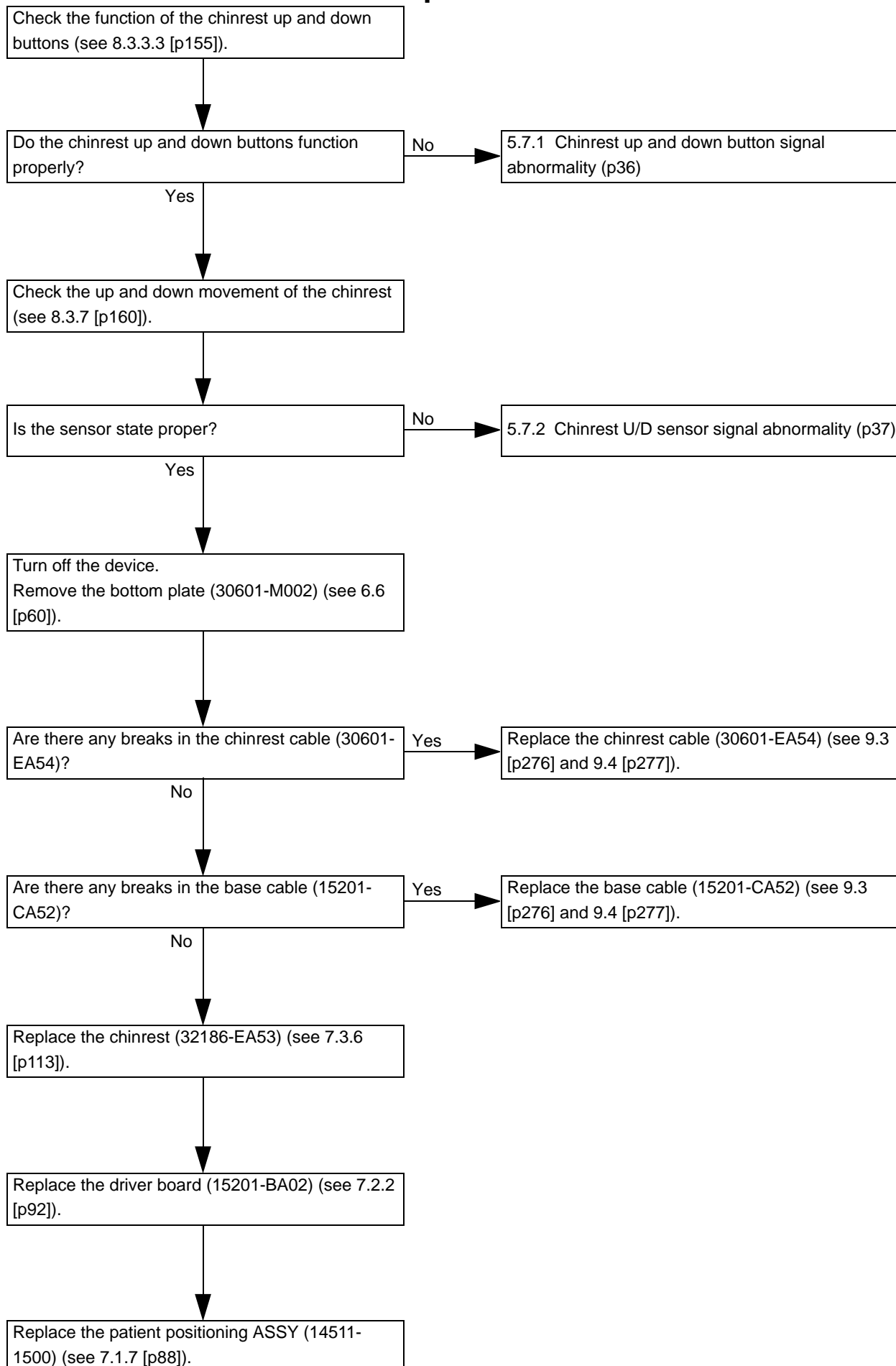
No

Replace the fixation lamp board (15201-BA19) (see 7.2.9 [p99]).

Replace the driver board (15201-BA02) (see 7.2.2 [p92]).



## 5.7 Chinrest does not Move Up or Down



## 5.7.1 Chinrest up and down button signal abnormality

Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).

Are there any breaks in the relay cable (15201-CA28)?

Yes

Replace the relay cable (15201-CA28) (see 9.3 [p276] and 9.4 [p277]).

No

Are there any breaks in the U/D unit cable (15201-CA05)?

Yes

Replace the U/D unit cable (15201-CA05) (see 9.3 [p276] and 9.4 [p277]).

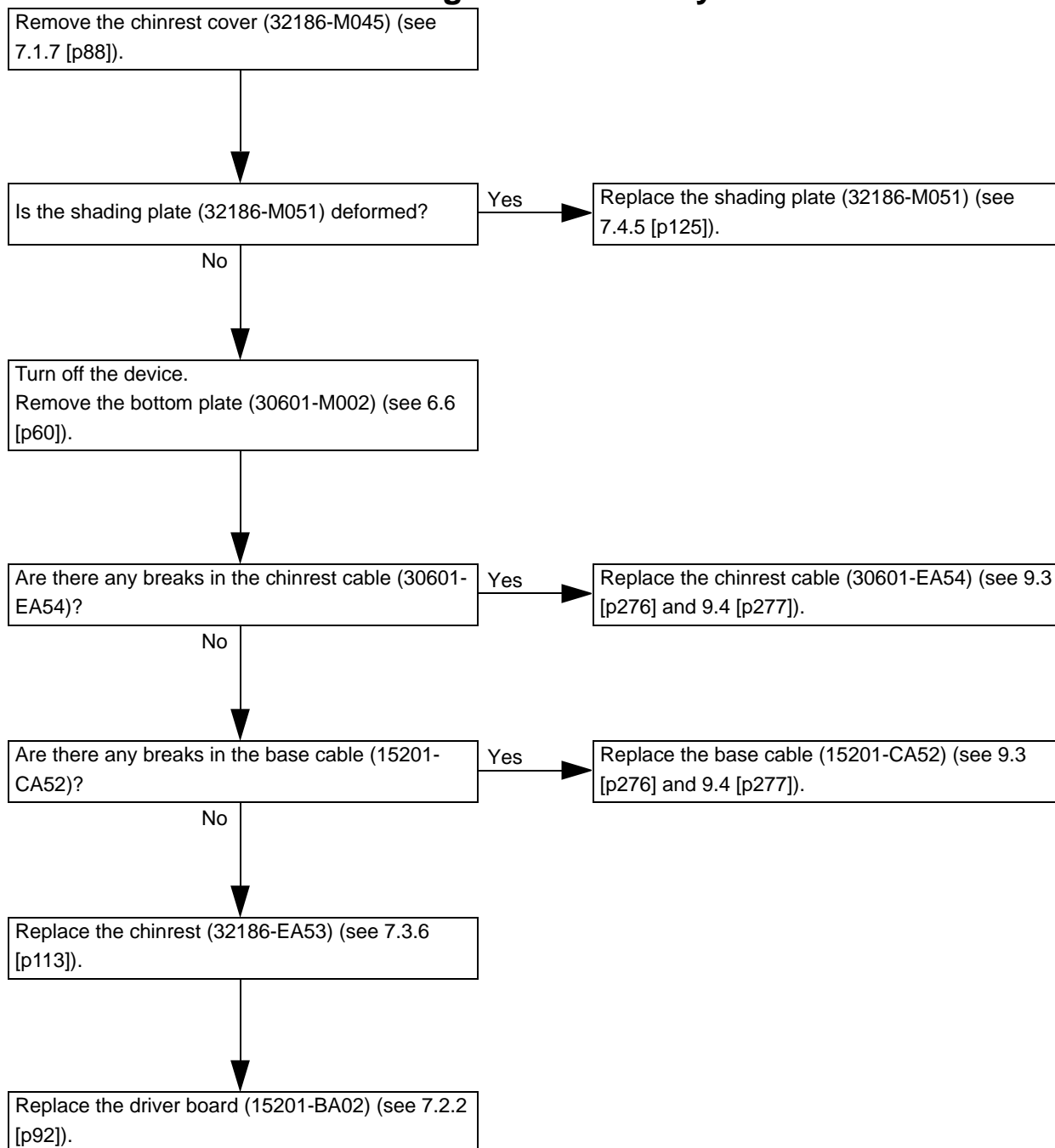
No

Replace the U/D SW board (30601-BA09) (see 7.2.12 [p103]).

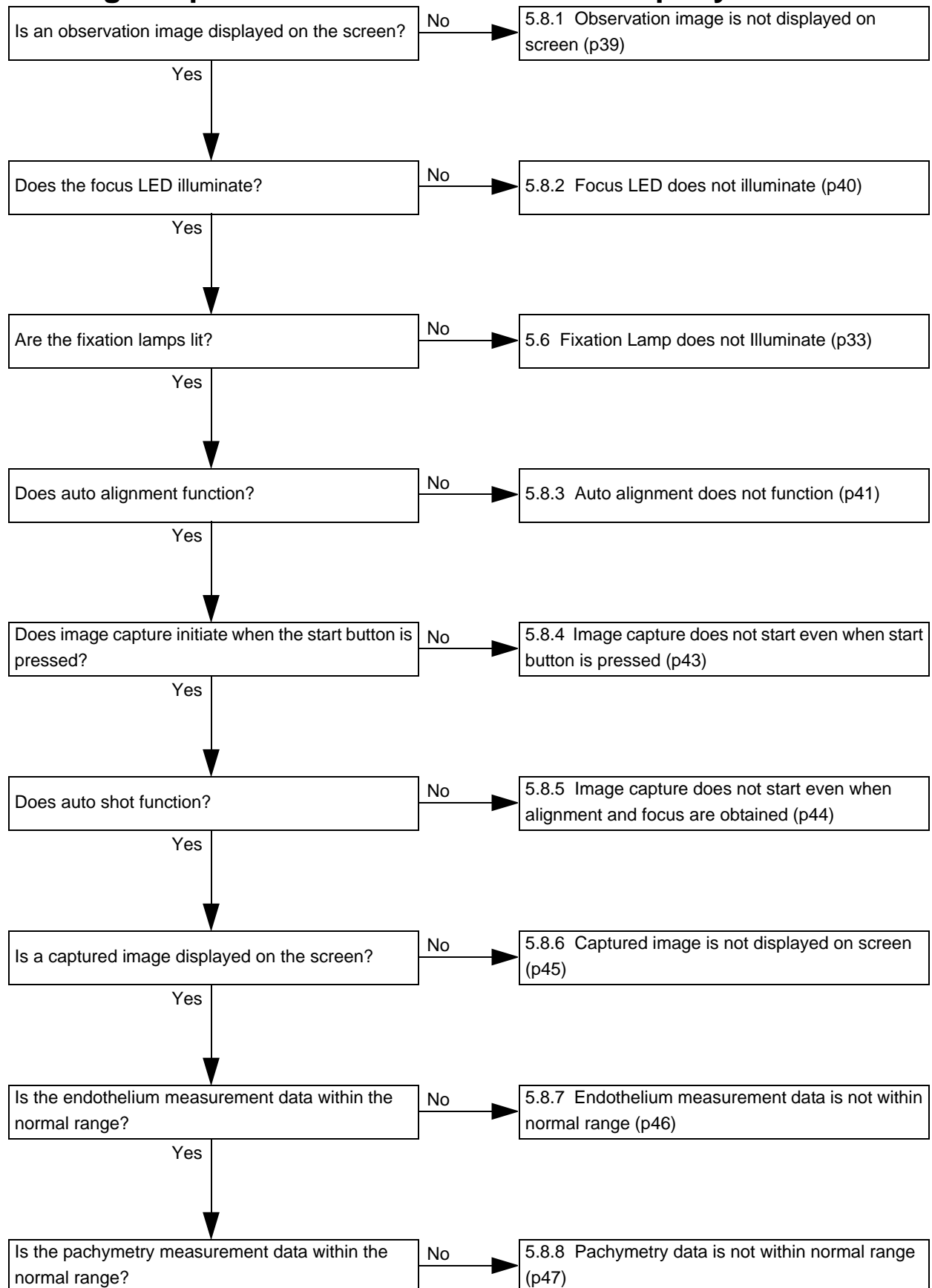
Replace the connection board (15201-BA08) (see 7.2.4 [p94]).

Replace the driver board (15201-BA02) (see 7.2.12 [p103]).

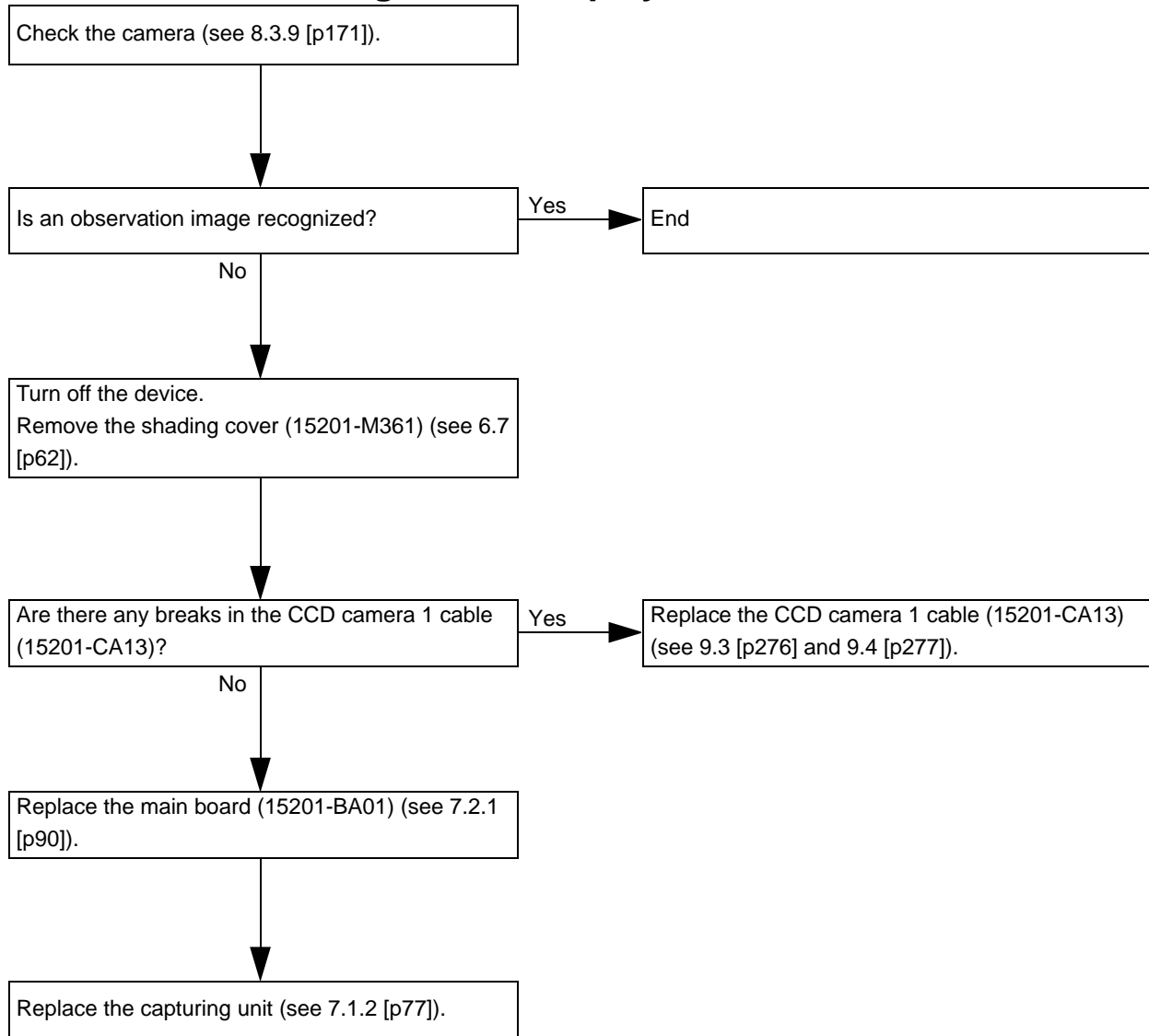
## 5.7.2 Chinrest U/D sensor signal abnormality



## 5.8 Image Capture cannot be Performed Properly

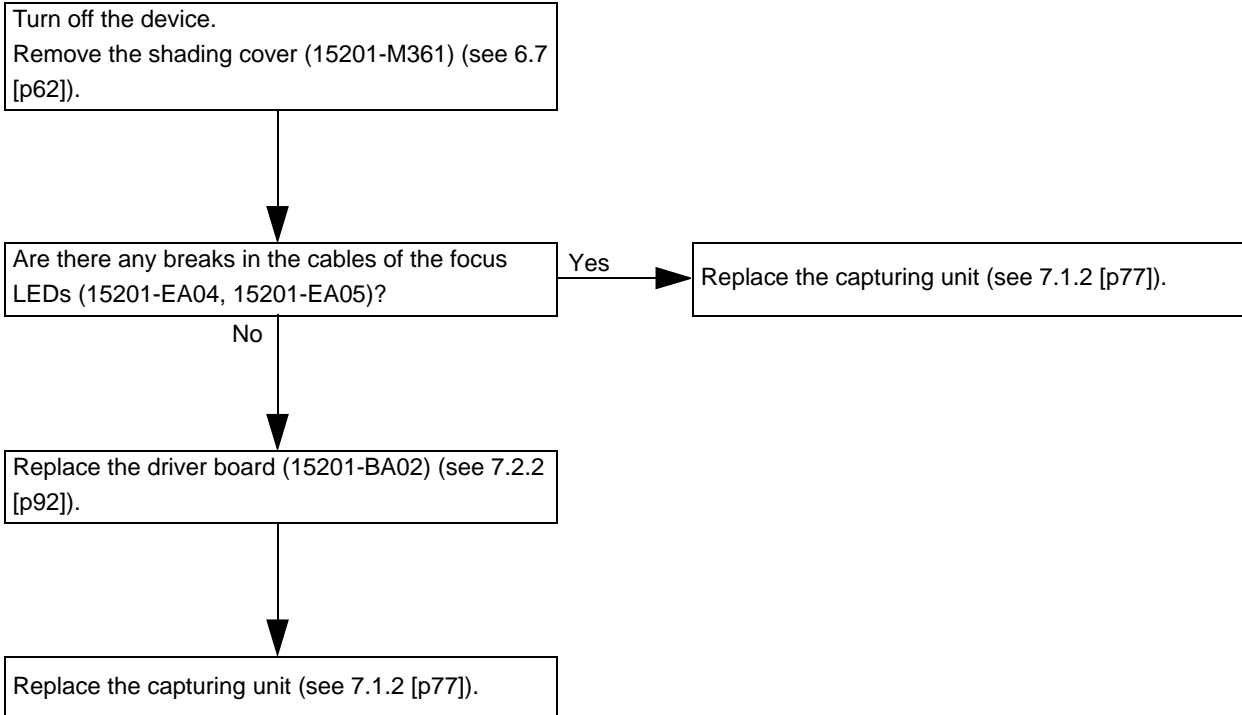


## 5.8.1 Observation image is not displayed on screen

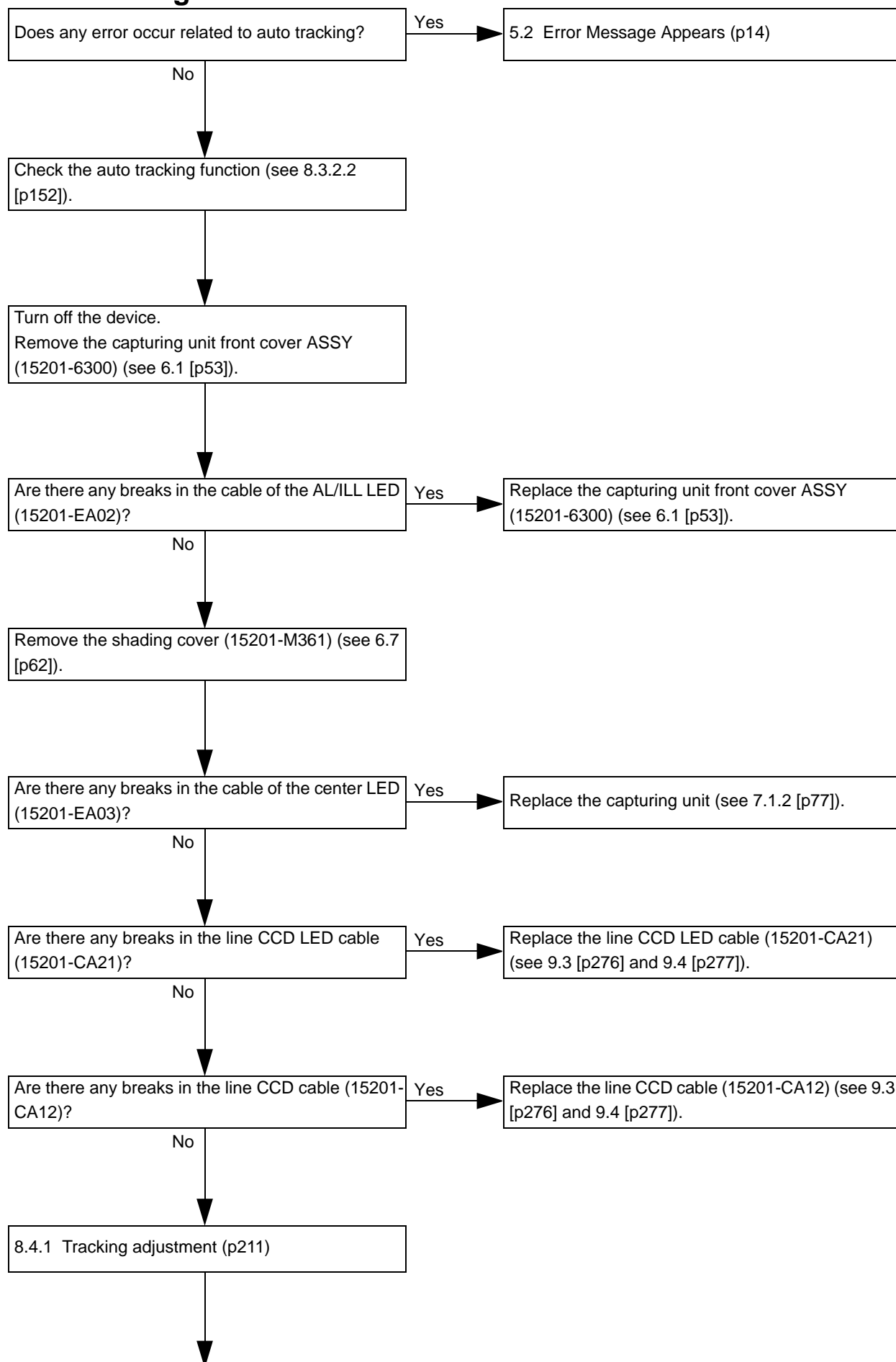


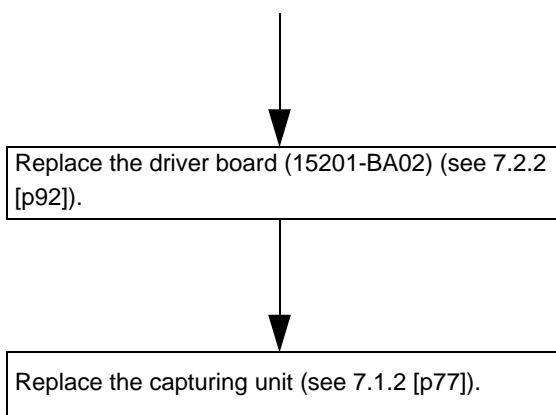
---

## 5.8.2 Focus LED does not illuminate



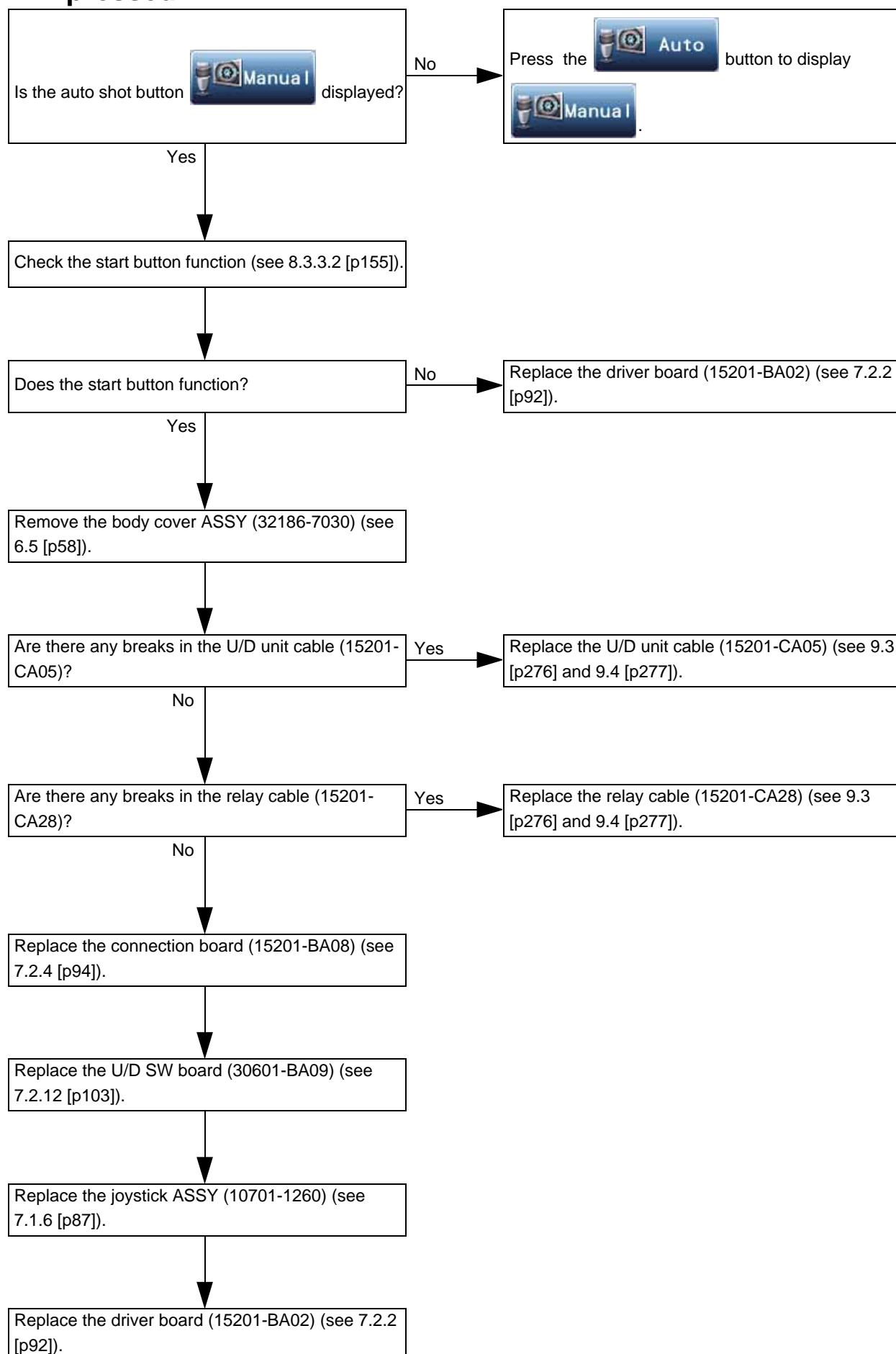
### 5.8.3 Auto alignment does not function



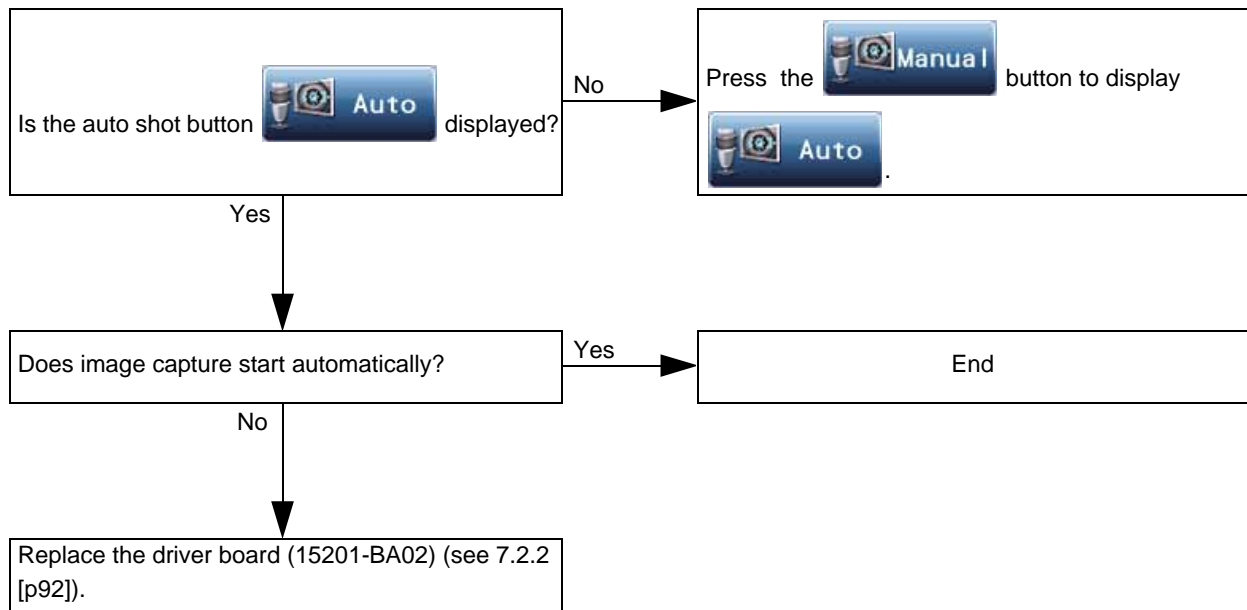




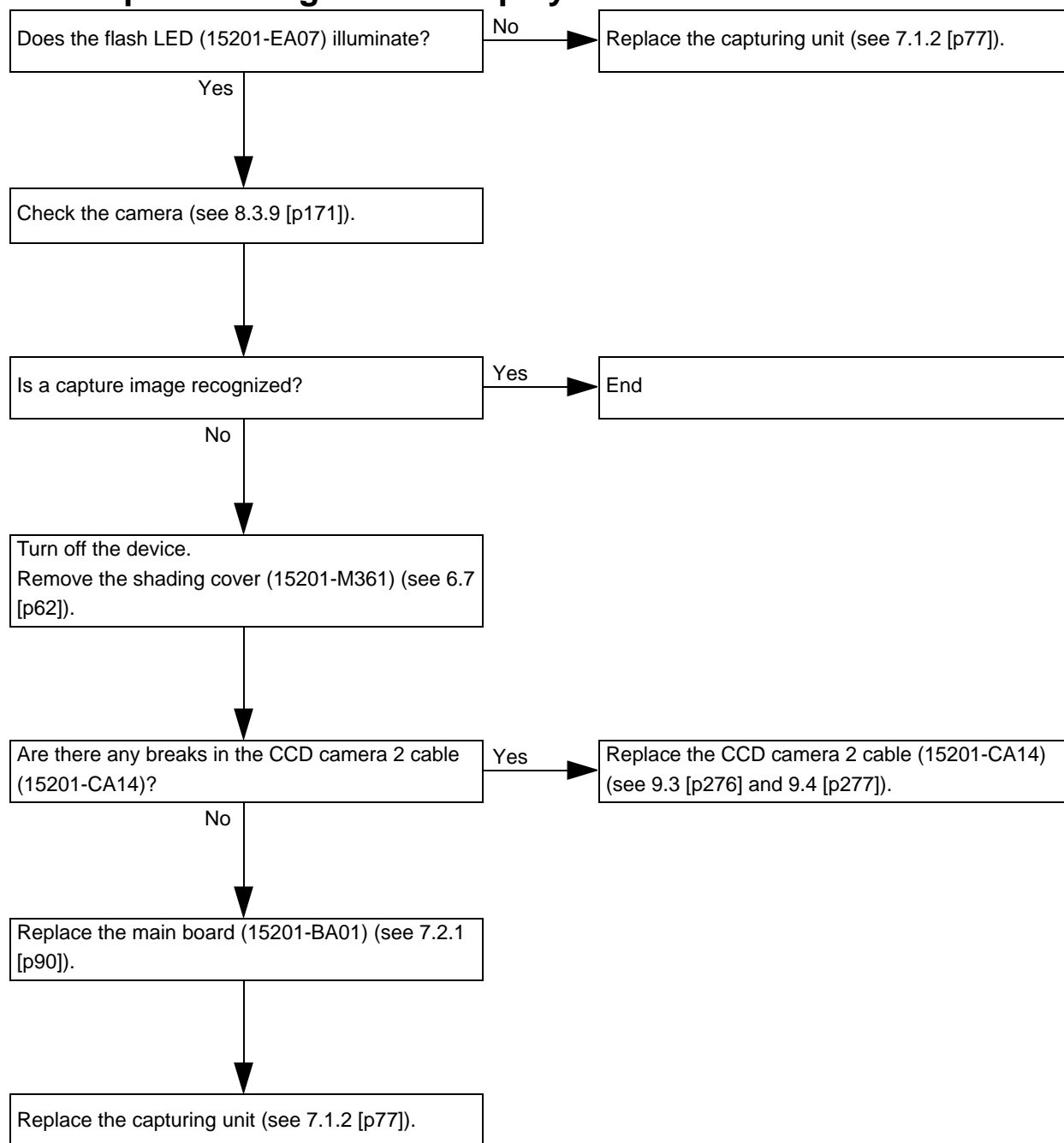
## 5.8.4 Image capture does not start even when start button is pressed



### 5.8.5 Image capture does not start even when alignment and focus are obtained



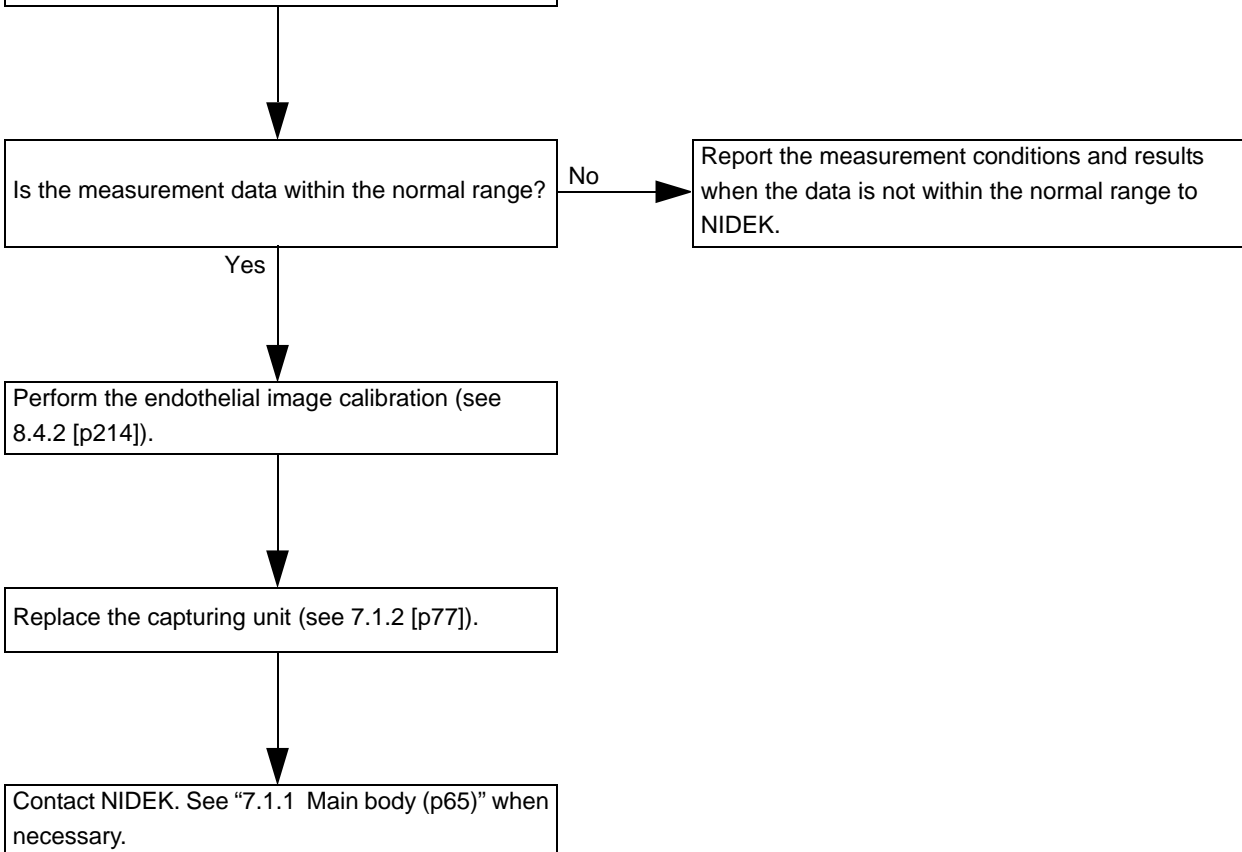
## 5.8.6 Captured image is not displayed on screen



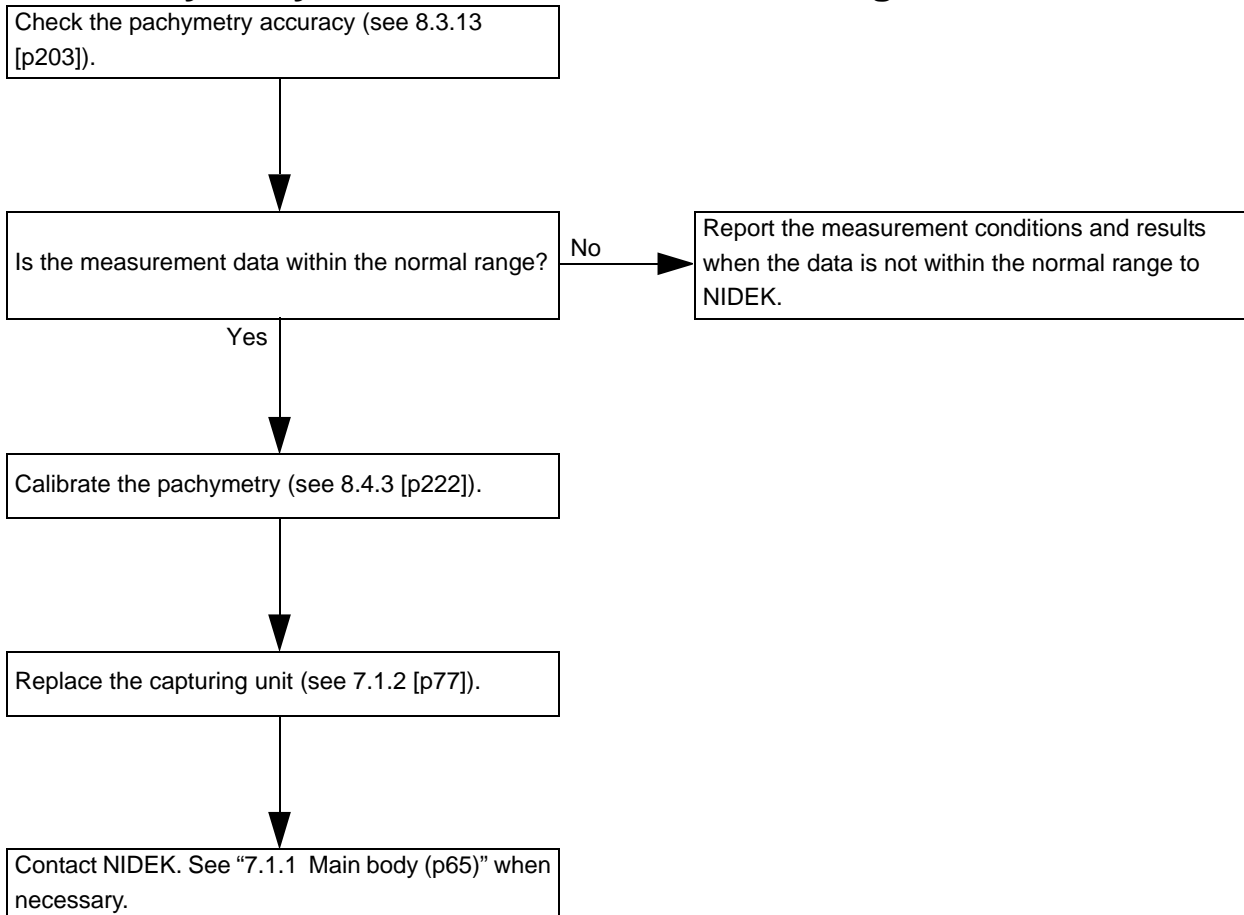
---

## 5.8.7 Endothelium measurement data is not within normal range

Check the endothelium measurement accuracy (see 8.3.12 [p176]).



## 5.8.8 Pachymetry data is not within normal range



---

## 5.9 Power LED does not Illuminate

Remove the LCD rear cover (14101-M716) (see 7.2.10 [p100]).

Are there any breaks in the LCD cable (14101-CA13)?

Yes

Replace the LCD cable (14101-CA13) (see 9.3 [p276] and 9.4 [p277]).

No

Are there any breaks in the cable of the power LED (14101-EA60)?

Yes

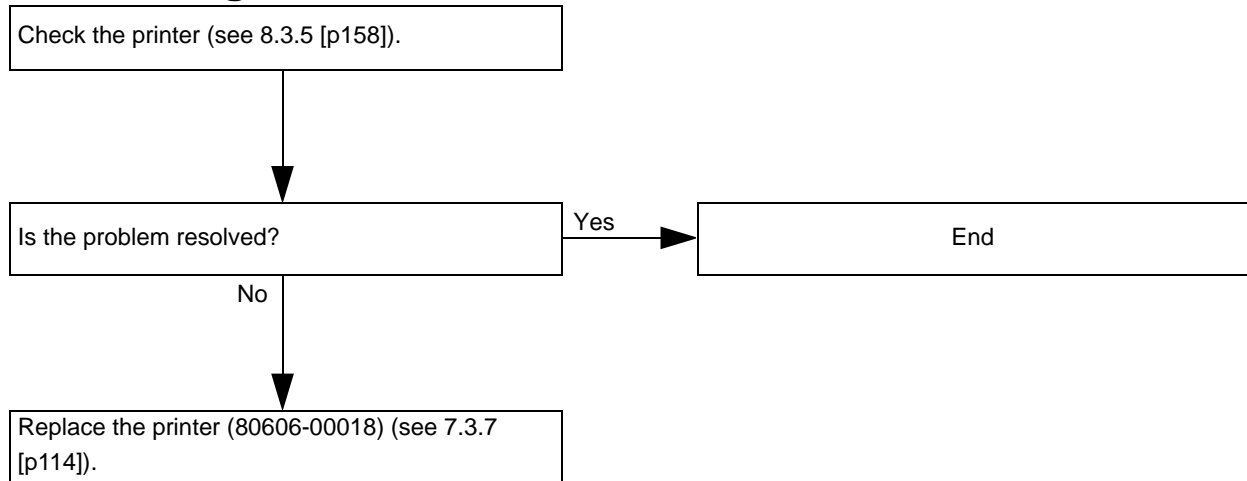
Replace the power LED (14101-EA60) (see 7.3.2 [p105]).

No

Replace the LCD board (14101-BA06) (see 7.2.10 [p100]).

---

## 5.10 Printing cannot be Performed

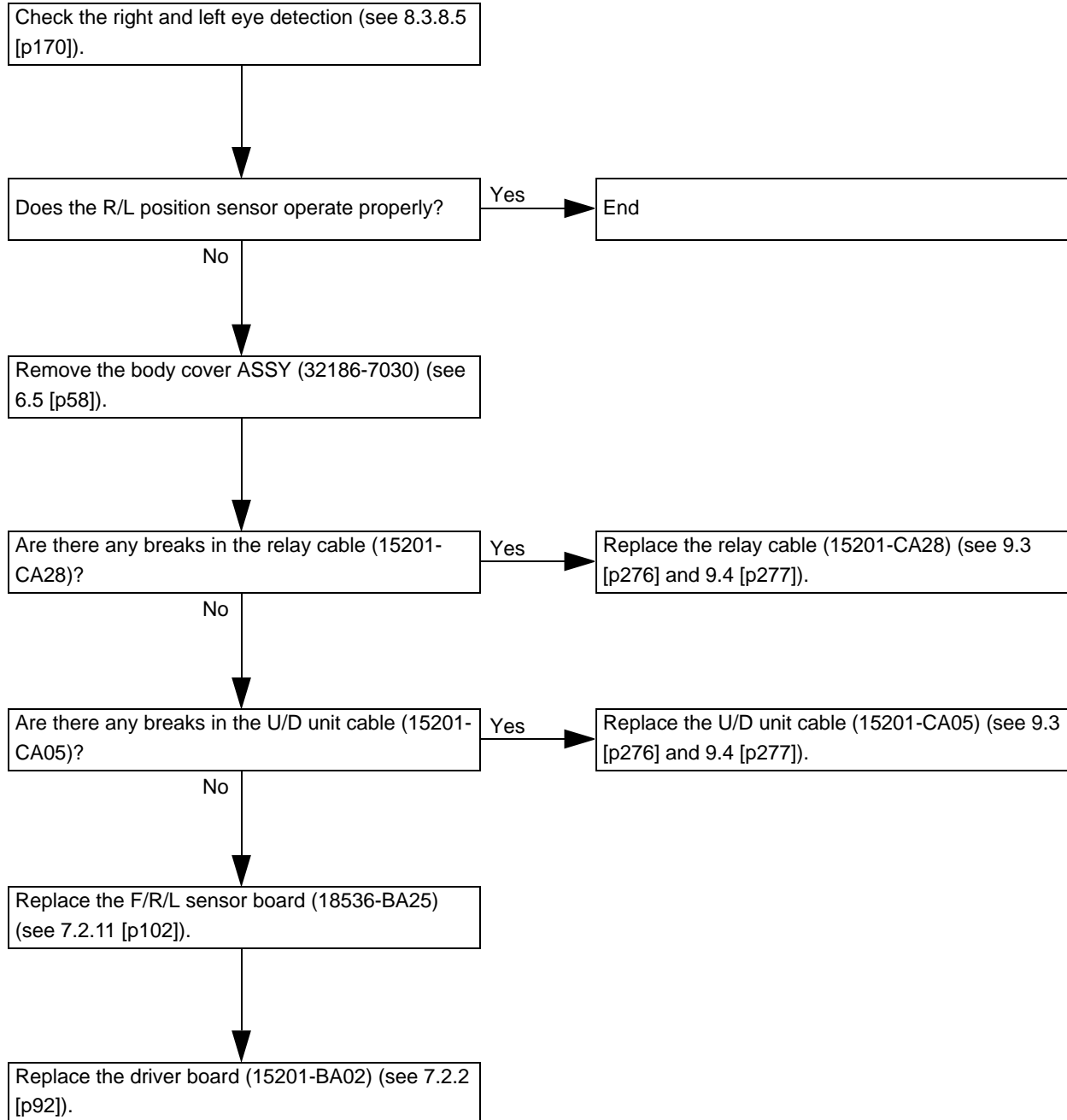


## **5.11 Brake cannot be Applied**

Replace the rubber foot for the brake ASSY (30601-2300) (see 7.5.2 [p135]).

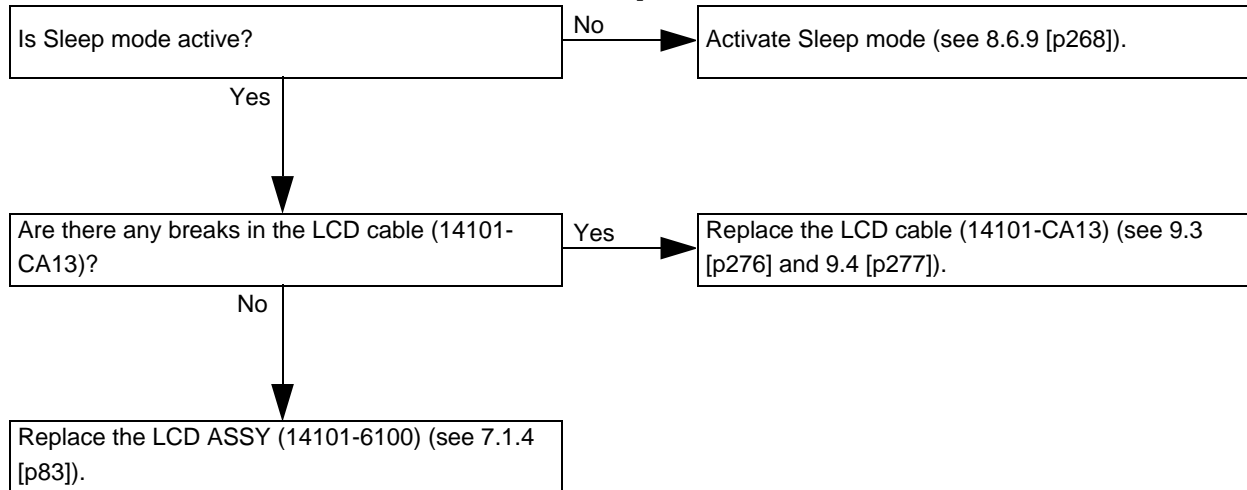


## 5.12 Right and Left Eyes cannot be Detected



---

## 5.13 Device does not Enter Sleep Mode

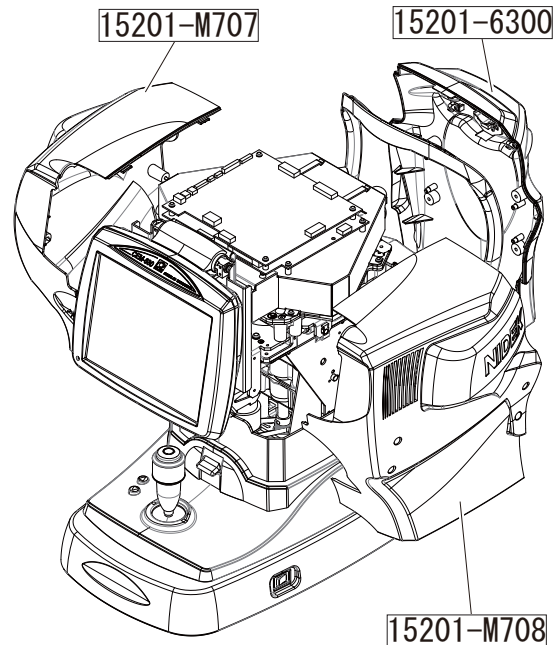


## 6 REMOVAL PROCEDURE

### 6.1 Capturing Unit Front Cover ASSY (15201-6300), Capturing Unit Left Cover (15201-M707), Capturing Unit Right Cover (15201-M708)

The capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) need to be removed at the same time.

Note



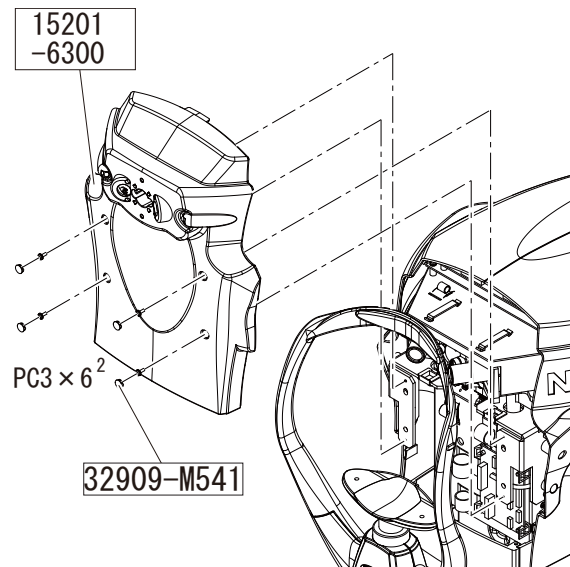
1. Remove the capturing unit front cover ASSY (15201-6300) as follows:

- 1) Remove the caps (32909-M541 [n = 4]).
- 2) Unscrew PC3 × 6 (n = 4).
- 3) Remove the capturing unit front cover ASSY (15201-6300).

⚠ Caution

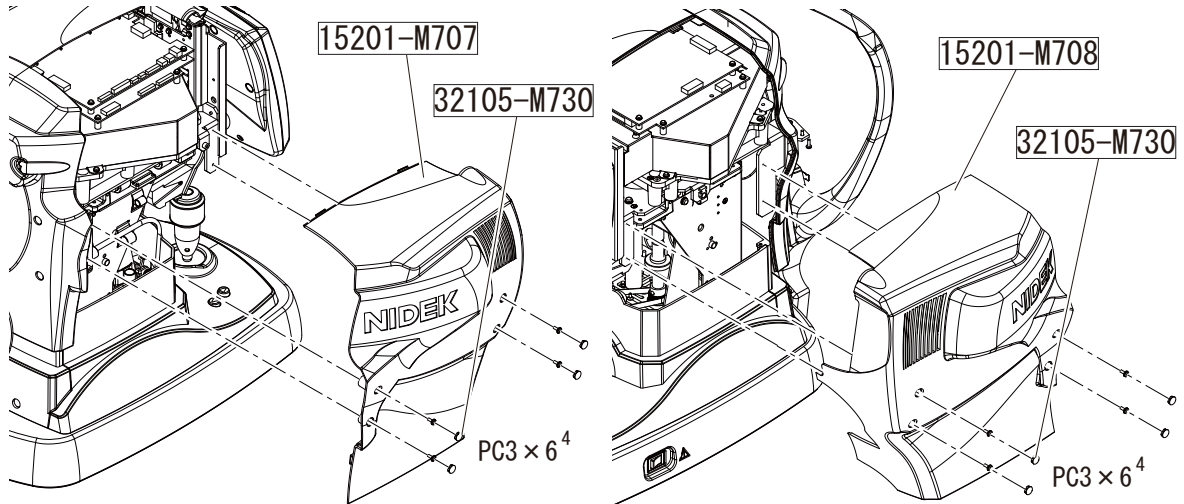
Do not pull out the ASSY forcibly as the cables are connected.


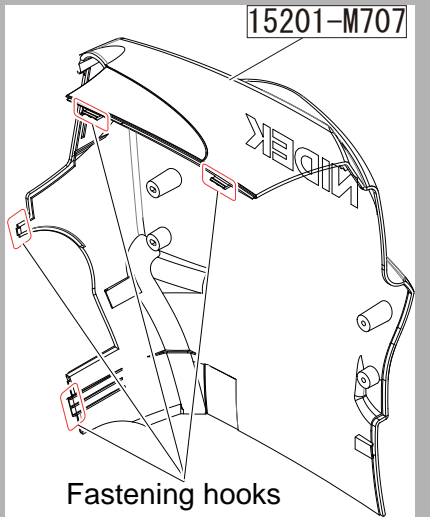
Lean the capturing unit front cover ASSY (15201-6300) against the device.



2 . Remove the capturing unit left cover (15201-M707) and capturing unit right cover (15201-M708) as follows:

- 1 ) Remove the caps (32909-M541 [n = 8]).
- 2 ) Unscrew PC3 × 6 (n = 8).
- 3 ) Remove the capturing unit left cover (15201-M707) and capturing unit right cover (15201-M708).



 <b>Caution</b>	<p>Gently press on the top of the capturing unit left cover (15201-M707) to release the fastening hooks, then press the lower back to release its fastening hook, and pull the covers apart.</p> <div data-bbox="1002 936 1434 1451" style="text-align: center;">  <p>15201-M707</p> <p>Fastening hooks</p> </div>
----------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

3 . Disconnect P205 and P206 from the driver board (15201-BA02) (see 9.3 [p276] and 9.4 [p277]).

4 . Remove the capturing unit front cover ASSY (15201-6300).

5 . Reassemble the parts in the reverse order.

## 6.2 Capturing Unit Rear Cover ASSY (14101-6000)

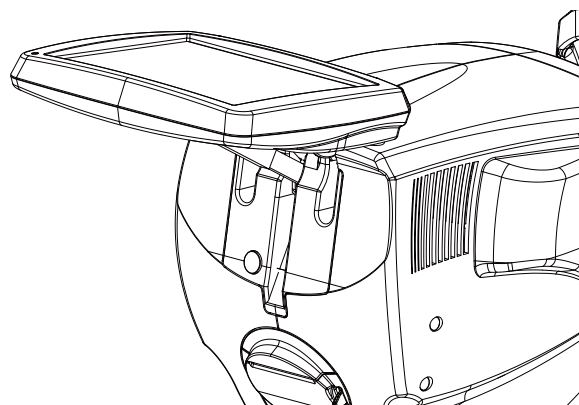


Caution

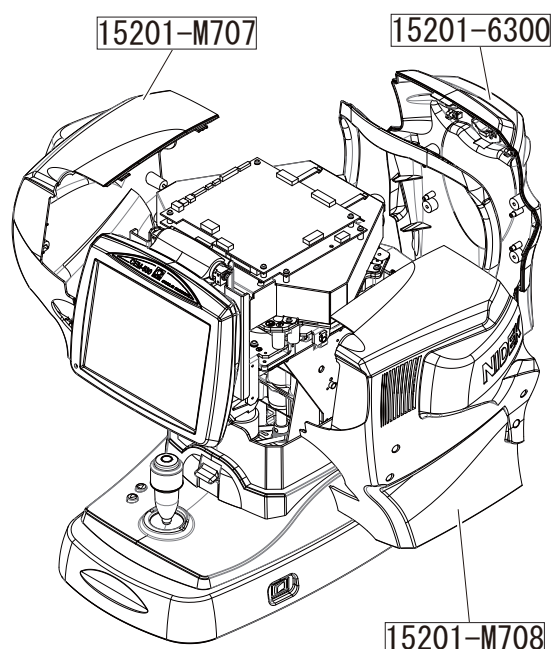
When disconnecting the cables from the connectors, release the locks of the connectors and pull the cables straight out.

Pulling on the cables without the locks released may damage the cables.

- 1 . Lift up the LCD ASSY (14101-6100) completely.

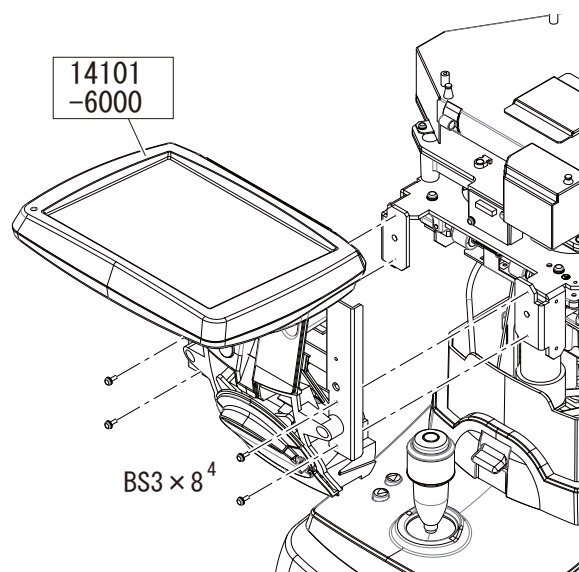


- 2 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).



- 3 . Disconnect P103 (J3) from the main board (15201-BA01) (see 9.3 [p276], 9.4 [p277], and 9.5.1 [p289]).
- 4 . Disconnect P207 (J7) and P208 (J8) from the driver board (15201-BA02) (see 9.3 [p276], 9.4 [p277], and 9.5.2 [p291]).

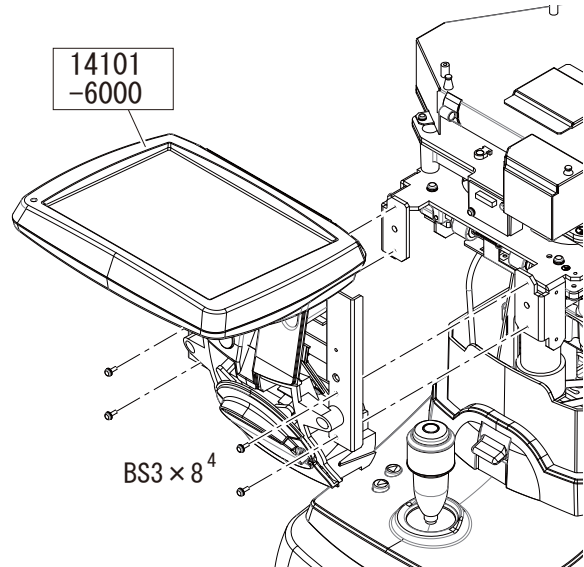
- 5 . Unscrew BS3 × 8 (n = 4) from the capturing unit rear cover ASSY (14101-6000).
- 6 . Remove the capturing unit rear cover ASSY (14101-6000).



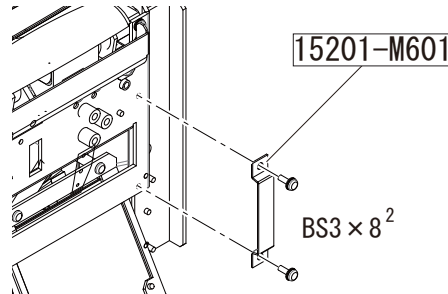
- 7 . Reassemble the parts in the reverse order.

## 6.3 Printer ASSY (14101-6200)


- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

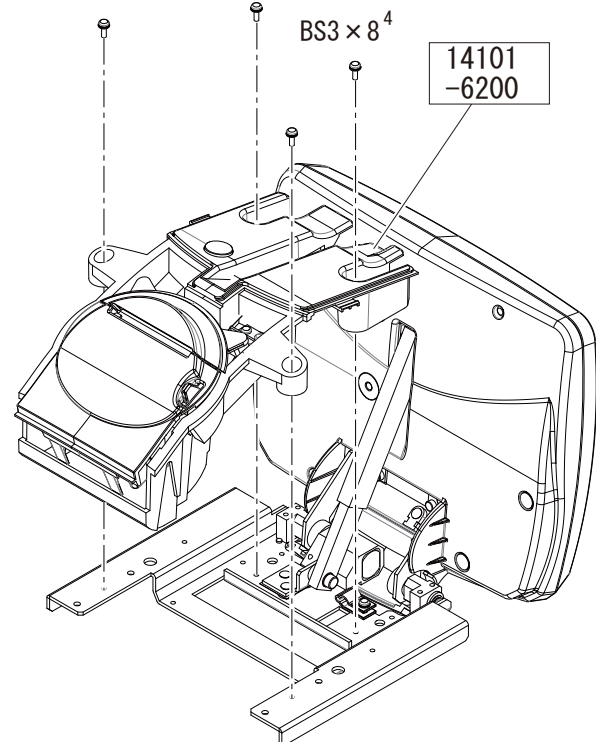


- 2 . Unscrew BS3 x 8 (n = 2) from the cable clamp (15201-M601).
- 3 . Remove the cable clamp (15201-M601).



- 4 . Unscrew BS3 x 8 (n = 4) from the printer ASSY (14101-6200).
- 5 . Remove the printer ASSY (14101-6200).

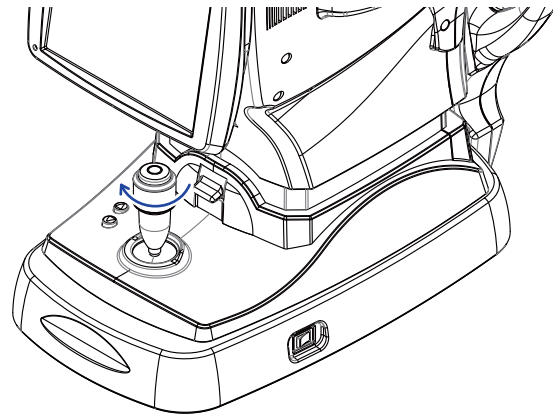
 <b>Caution</b>	Do not pull out the ASSY forcibly as the cables are connected.
----------------------------------------------------------------------------------------------------	----------------------------------------------------------------



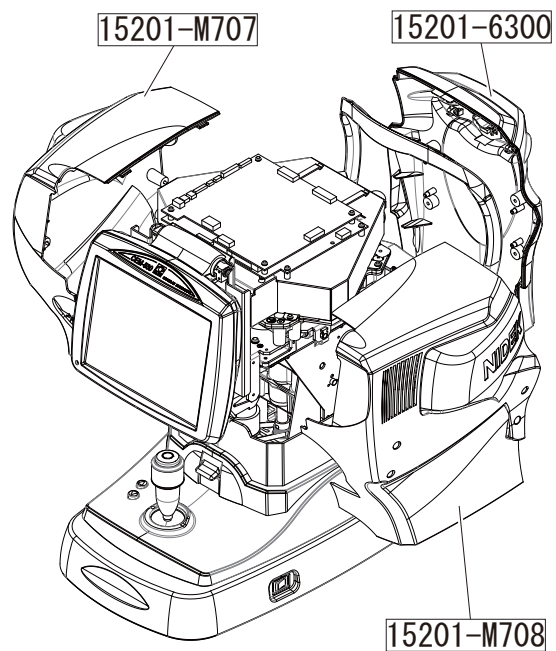
- 6 . Reassemble the parts in the reverse order.

## 6.4 Body Front Cover (18536-M702)

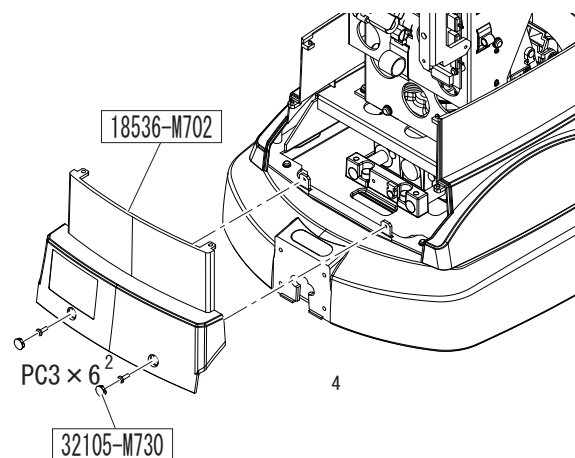
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).



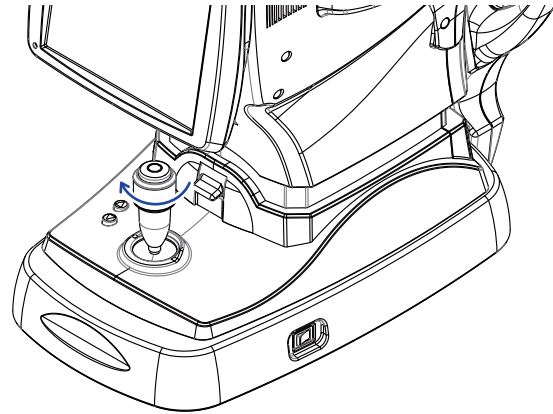
- 5 . Remove the caps (32105-M730 [n = 2]).
- 6 . Unscrew PC3 × 6 (n = 2) from the body front cover (18536-M702).
- 7 . Remove the body front cover (18536-M702).



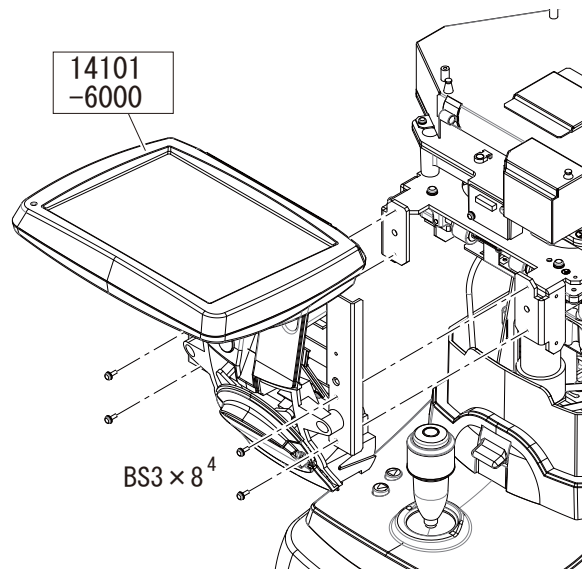
- 8 . Reassemble the parts in the reverse order.

## 6.5 Body Cover ASSY (32186-7030)

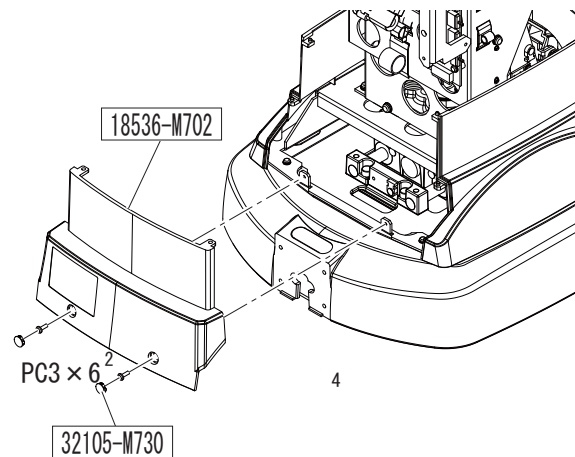
- 1 . Turn on the device.
- 2 . Turn the joystick knob clockwise to raise the capturing unit to the top.
- 3 . Turn off the device.



- 4 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

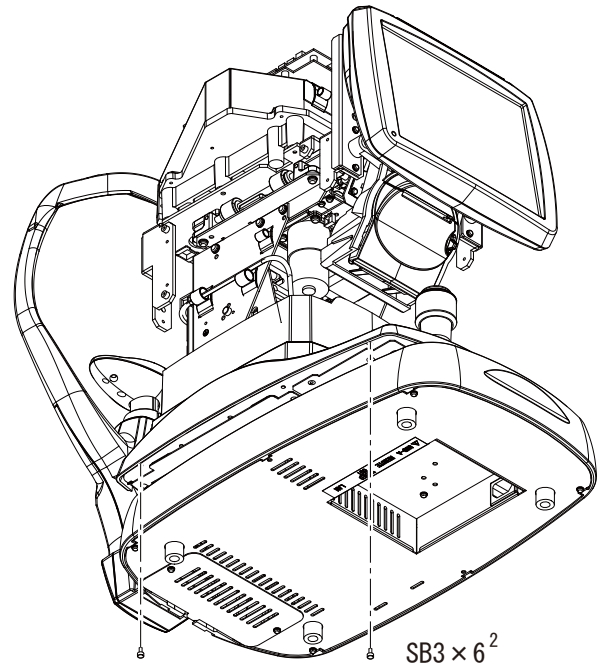


- 5 . Remove the body front cover (18536-M702) (see 6.4 [p57]).

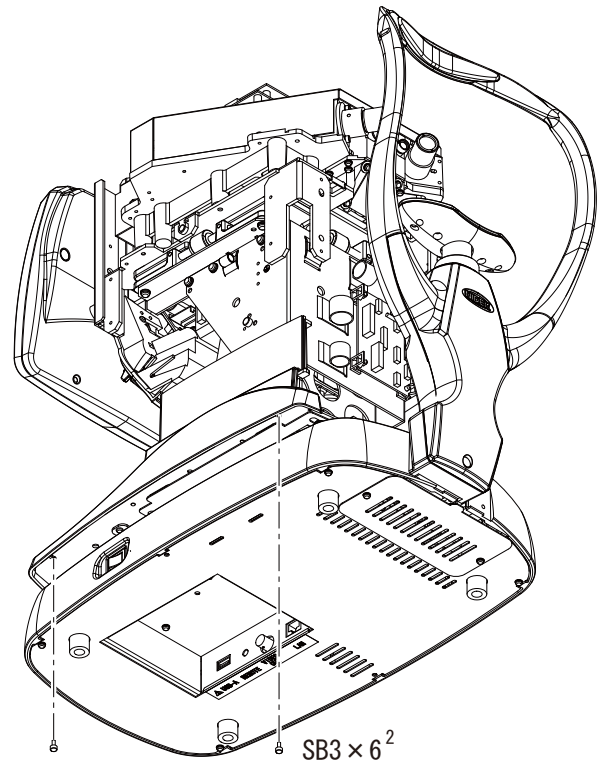




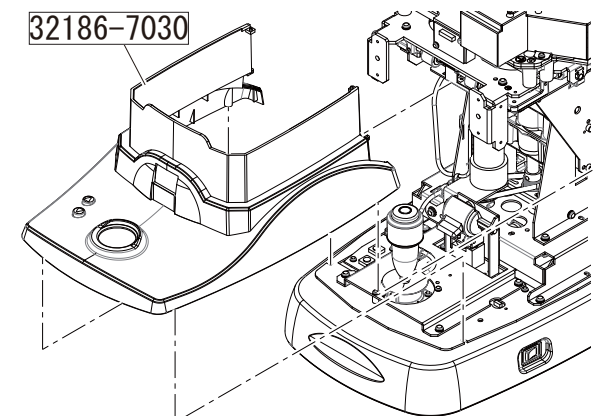
- 6 . Move the capturing unit to the right to unscrew SB3 × 6 (n = 2) from the body cover ASSY (32186-7030).



- 7 . Move the capturing unit to the left to unscrew SB3 × 6 (n = 2) from the body cover ASSY (32186-7030).



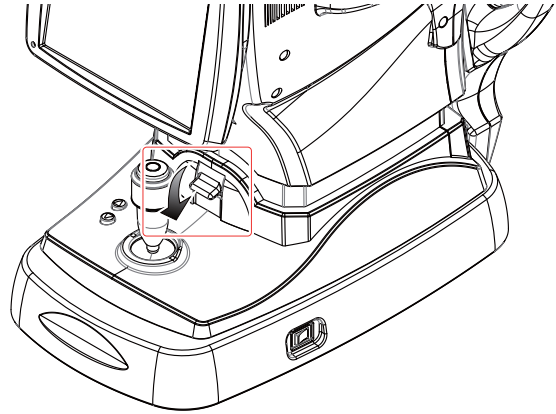
- 8 . Remove the body cover ASSY (32186-7030).



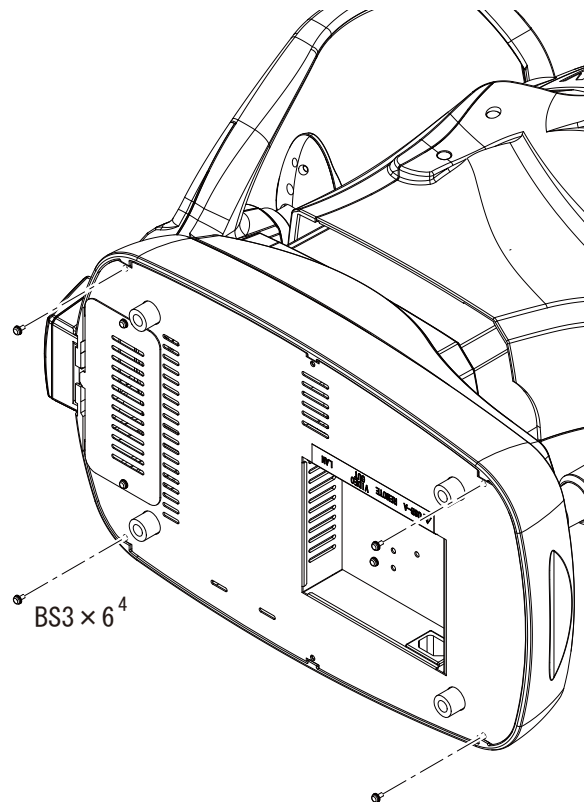
- 9 . Reassemble the parts in the reverse order.

## 6.6 Bottom Plate (30601-M002)

- 1 . Lower the locking lever to fasten the capturing unit.
- 2 . Remove the cables connected to the external equipment.

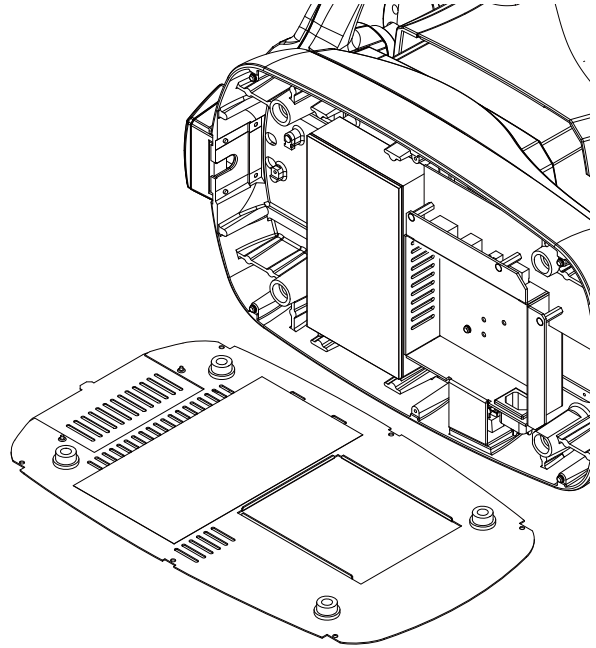


- 3 . Apply a cushion to the capturing unit and lay the device on its side with the power switch.
- 4 . Unscrew BS3 × 6 (n = 4) from the bottom plate (30601-M002).



---

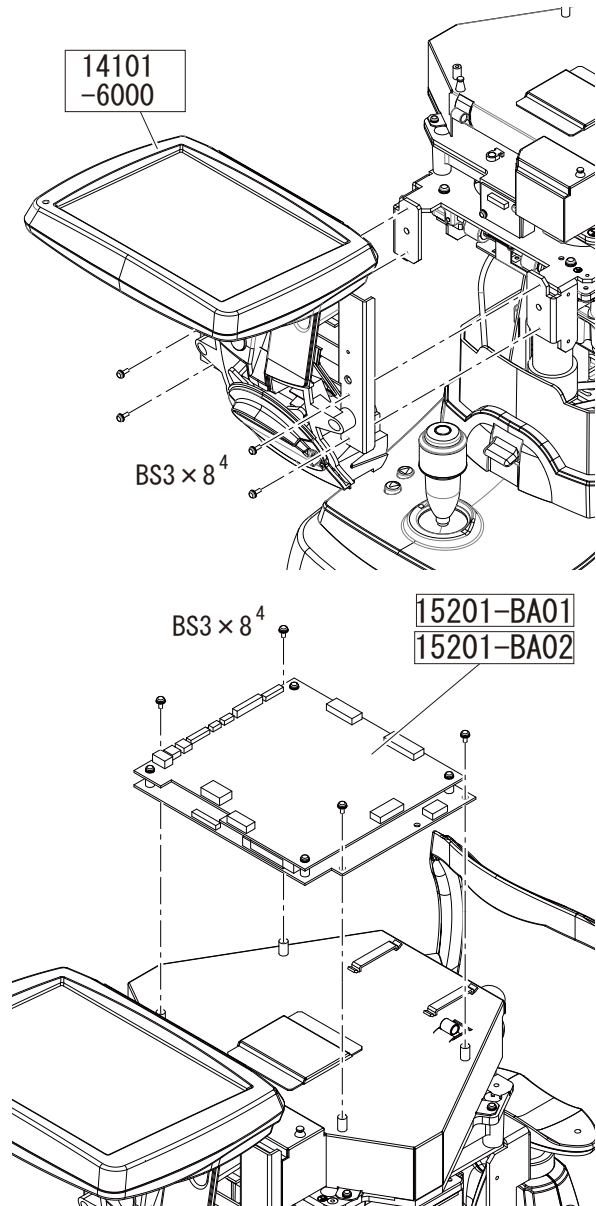
5 . Remove the bottom plate (30601-M002).



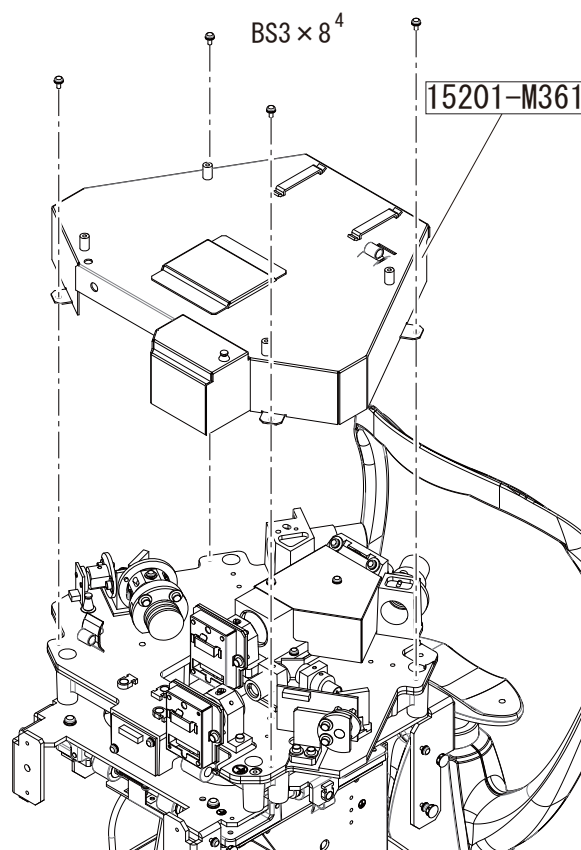
6 . Reassemble the parts in the reverse order.

## 6.7 Shading Cover (15201-M361)

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).
- 2 . Disconnect all cable connectors from the driver board (15201-BA02) and main board (15201-BA01) (see 9.5.1 [p289] and 9.5.2 [p291]).
- 3 . Unscrew BS3 × 8 (n = 4) from the main board (15201-BA01).
- 4 . Remove the driver board (15201-BA02) and main board (15201-BA01).



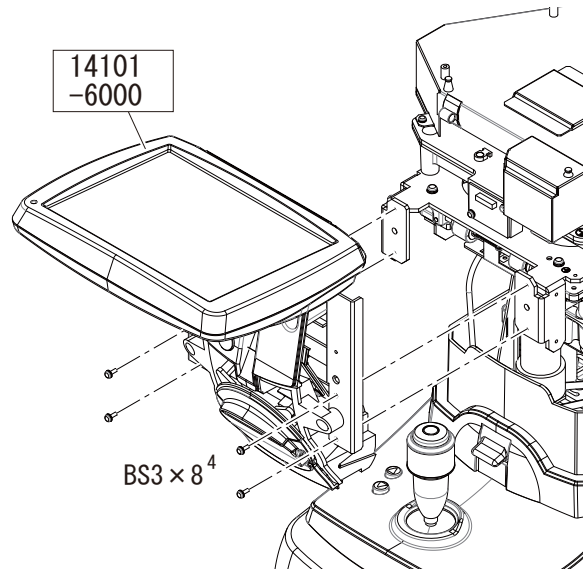
- 5 . Unscrew BS3 × 8 (n = 4) on top of the shading cover (15201-M361).
- 6 . Remove the shading cover (15201-M361).



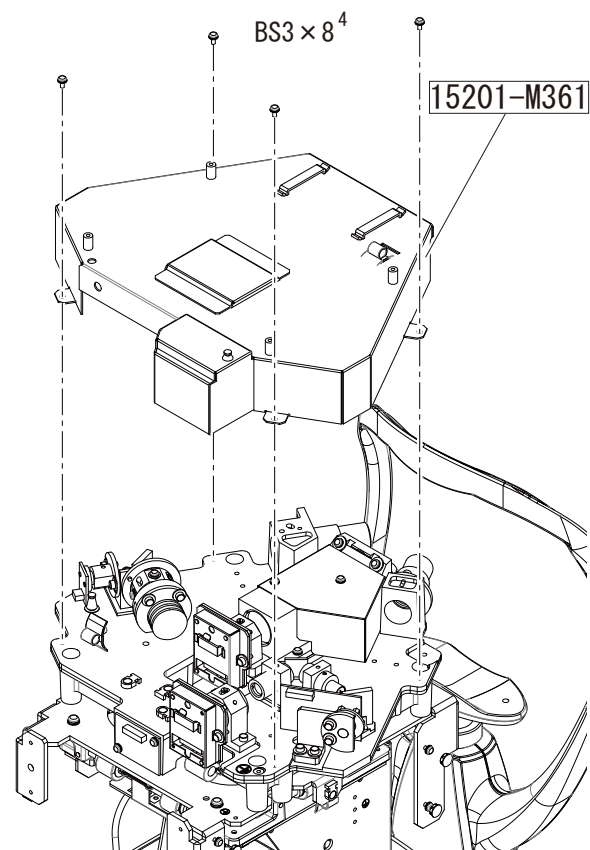
- 7 . Reassemble the parts in the reverse order.

## 6.8 Shading Cover 2 (15201-M362)

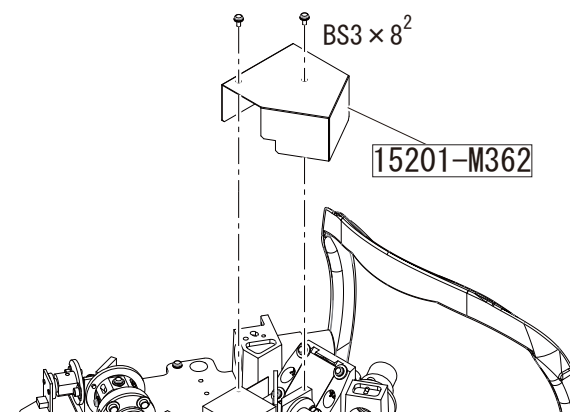
- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 2 . Remove the shading cover (15201-M361) (see 6.7 [p62]).



- 3 . Unscrew BS3 x 8 (n = 2) from shading cover 2 (15201-M362).
- 4 . Remove shading cover 2 (15201-M362).



- 5 . Reassemble the parts in the reverse order.

# 7 REPLACEMENT PROCEDURE

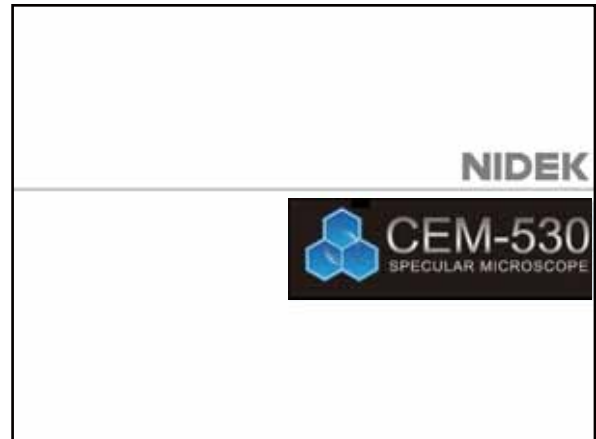
## 7.1 ASSYs

### 7.1.1 Main body

Replacement part: 15201-0020 (for N. Inc)

15201-0040 (for outside Japan)

- 1 . Turn on the device to be replaced.



- 2 . Print the parameter settings as follows:

- 1 ) Press the  button.



The Menu dialog box is displayed.

- 2 ) Press the  button.



The Settings screen is displayed

3 ) Select the  button.



The Print dialog box is displayed.

4 ) Press the  button.



The saved parameter data is printed.

```

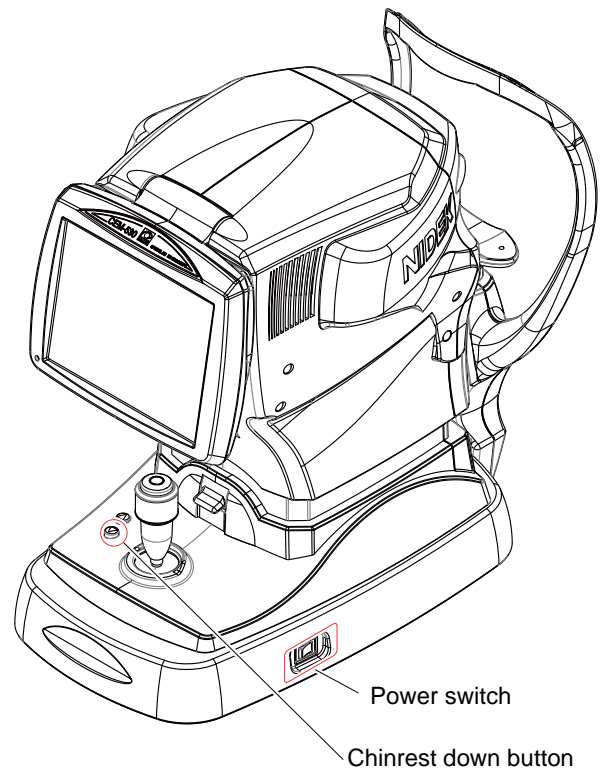
.....
                        MAINTENANCE
.....
LAN SETTING
TCP / IP
DHCP                      NO
IP ADDRESS
192. 168. 0. 70
SUBNET MASK
255. 255. 255. 0
SILE SHARING
USER NAME
PASSWORD                  Guest
DOMAIN                    *****
PC NAME                   Workgroup
                           PC
DATA
OUTPUT MODE               ACK
TIME OUT                  5
STYLE SHEET               OFF
FOLDER NAME
                           Data
READER SETTINGS
MODE                      BARCODE
START --- LENGTH ---
DATE , TIME
2011 / 10 / 27           09:59
.....
                        PARAMETERS
.....
TAKE
FIXATION BLINK            YES
RESULT DISPLAY            MULTI
CHECK DATA CLEAR        ON
PRINT
PRINTER                   ON
PRINTER MODE              BUILT-IN
SET NO.                   0001
PRINT&CLEAR              NO
DATA PRINT                YES
PATIENT NO.              YES
RCONO. PRINT              NO
NAME PRINT                YES
IMAGE PRINT               YES
COMMENT PRINT             YES
OTHERS
LANGUAGE                  ENGLISH
BEEP                      OFF
LCD BACKLIGHT             LOW
NAME                      L. F MI.
SLEEP TIME( MIN )        5
DATA FORMAT               Y / M / D
.....
                        PROGRAM VERSION
.....
SOFT VER : V 1. 00. 01
FPGA VER : V 1. 00

```



3 . Place the device in Packing mode.

- 1 ) While pressing the chinrest down button, turn on the power switch.



“PACKING MODE” appears. The chinrest and capturing unit move to their lowest positions.

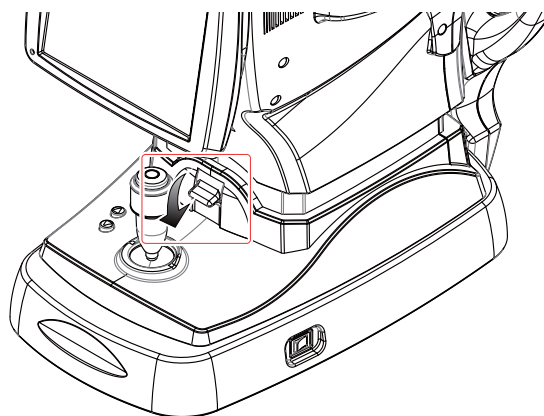
PACKING MODE

“PACKING POSITION IS COMPLETED SHUT DOWN PLEASE” appears.

PACKING MODE  
PACKING POSITION  
IS COMPLETED  
SHUT DOWN PLEASE

4 . Turn off the device.

- 5 . Press down the locking lever to lock the main unit to the base unit.
- 6 . Remove all cables connected to the external equipment.



- 7 . Start the replacement device.
- 8 . Confirm that initialization is complete.
- 9 . Perform the procedure as in “7.1.1.1 Setting the parameters” (p69).



### 7.1.1.1 Setting the parameters

According to the printed data while the Maintenance screen is displayed, set the parameters for the customer (see 8.6 [p244]).

- 1 . Press the  button.



The menu dialog box is displayed.

- 2 . Press the  button.



The Settings screen for "Take" is displayed.



3 . According to the printed data, set the parameters (see 8.6.7 [p262]).

PARAMETERS	
TAKE	
FIXATION BLINK	YES
RESULT DISPLAY	MULTI
CHECK DATA CLEAR	ON
PRINT	
PRINTER	ON
PRINTER MODE	BUILT-IN
SET NO.	0001
PRINT&CLEAR	NO
DATA PRINT	YES
PATIENT NO.	YES
RCONO. PRINT	NO
NAME PRINT	YES
IMAGE PRINT	YES
COMMENT PRINT	YES

4 . Press the  button.

The Settings screen for “Print” is displayed.

5 . According to the printed data, set the parameters (see 8.6.8 [p264]).

PARAMETERS	
TAKE	
FIXATION BLINK	YES
RESULT DISPLAY	MULTI
CHECK DATA CLEAR	ON
PRINT	
PRINTER	ON
PRINTER MODE	BUILT-IN
SET NO.	0001
PRINT&CLEAR	NO
DATA PRINT	YES
PATIENT NO.	YES
RCONO. PRINT	NO
NAME PRINT	YES
IMAGE PRINT	YES
COMMENT PRINT	YES
OTHERS	
LANGUAGE	ENGLISH
BEEP	OFF
LCD BACKLIGHT	LOW
NAME	L. F MI.
SLEEP TIME(MIN)	5
DATA FORMAT	Y / M / D

## 6 . Set the patient number.

- 1 ) Press the **Set No.** button.



The Set No. dialog box is displayed.

- 2 ) Enter the patient number with the numeric keypad.

- 3 ) Press the **OK** button.



The Settings screen for "Print" is displayed.



- 7 . Press the **Others** button.



The Settings screen for “Others” is displayed.



8 . According to the printed data, set the parameters (see 8.6.8 [p264]).

TAKE	
FIXATION BLINK	YES
RESULT DISPLAY	MULTI
CHECK DATA CLEAR	ON
PRINT	
PRINTER	ON
PRINTER MODE	BUILT-IN
SET NO.	0001
PRINT&CLEAR	NO
DATA PRINT	YES
PATIENT NO.	YES
RCONO. PRINT	NO
NAME PRINT	YES
IMAGE PRINT	YES
COMMENT PRINT	YES
OTHERS	
LANGUAGE	ENGLISH
BEEP	OFF
LCD BACKLIGHT	LOW
NAME	L. F. M.
SLEEP TIME(MIN)	5
DATA FORMAT	Y / M / D




9 . Press the  button.

The Capture screen is displayed again.

10. Press the  button.



The menu dialog box is displayed.

11. Press the  button.



The Maintenance screen is displayed.

12. Press the LAN Settings button.



The LAN Settings screen is displayed.





13. According to the printed data, perform the LAN settings (see 8.6.2 [p246]).

MAINTENANCE

LAN SETTING

TCP / IP

DHCPNO

IP ADDRESS192. 168. 0. 70

SUBNET MASK255. 255. 255. 0

FILE SHARING

USER NAMEGuest

PASSWORD\*\*\*\*

DOMAIN

PC NAMEWorkgroup

DATA

OUTPUT MODEACK

TIME OUT5

STYLE SHEETOFF

FOLDER NAMEData

READER SETTINGS

MODEBARCODE

START --- LENGTH ---

DATE , TIME2011 / 10 / 27 09:59

LAN設定

TCP/IP

274共有

TCP/IP

DHCP

192. 168. 0. 70

255. 255. 255. 0

LAN Settings

TCP/IP

File Sharing

User NameGuest

Password\*\*\*\*

DomainWorkgroup

PC NamePC

Folder Output Mode

OFF

ON

ACK

Timeout5 sec

Style Sheet

Folder NameData

Test

⚠ Caution

"Password" for File Sharing is masked and is not printed, so the customer needs to set another password.

14. Press the  button.



The Maintenance screen is displayed.

15. Press the  button.





The Reader Settings screen is displayed.



16. According to the printed data, set the parameters.

```

..... MAINTENANCE .....
LAN SETTING
TCP/IP
DHCP NO
IP ADDRESS 192.168.0.70
SUBNET MASK 255.255.255.0
FILE SHARING
USER NAME Guest
DOMAIN Workgroup
PS NAME PC
DATA
OUTPUT MODE ACK
TIME OUT 5
STYLE SHEET OFF
FOLDER NAME Data
READER SETTING
MODE BARCODE
START --- LENGTH ---
CLOCK SET
2011. 6. 15 14:15
  
```



17. Press the  button.



The Maintenance screen is displayed.

18. Press the **Date, Time** button.



The Date, Time window is displayed.

19. Set the date and time (see 8.6.5 [p260]).

20. Press the **Close** button.



The Maintenance screen is displayed.

21. Perform the touch-panel calibration as necessary (see 8.6.4 [p258]).

22. Press the **Back** button.



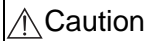
The Capture screen is displayed again.



23. Check the device operation at the time of installation.
24. After the check, confirm with the customer that the parameter settings are the same as before.

## 7.1.2 Adjusted SM capturing ASSY (15201-9100)

Replacement part: 15201-9100



Caution

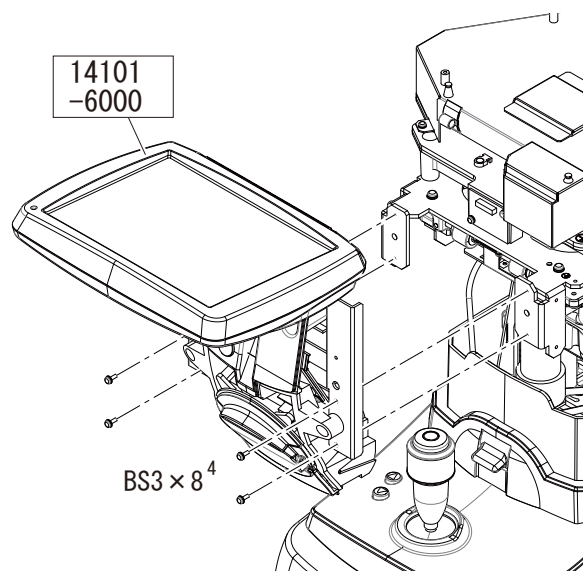
The adjusted SM capturing ASSY comes with the driver board (15201-BA02). The driver board (15201-BA02) is already adjusted to fit the SM capturing ASSY.

The adjusted SM capturing ASSY (15201-9100) and driver board need to be replaced at the same time.

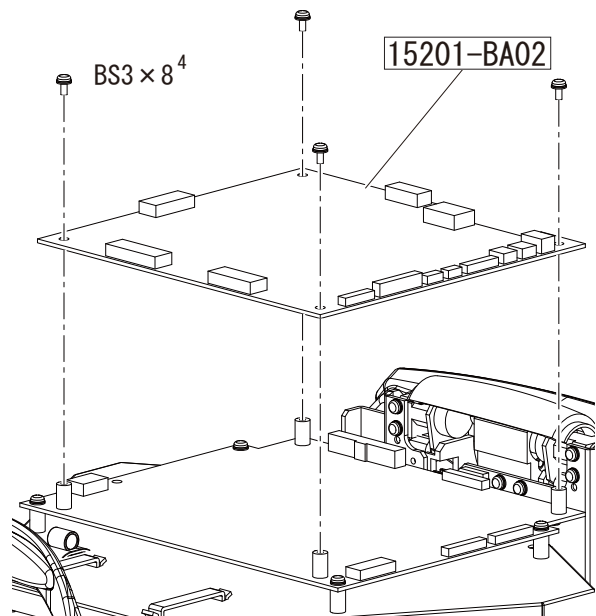
- 1 . Print the parameter data (see 8.6.10 [p269]).

MAINTENANCE	
LAN SETTING	
TCP/IP	
DHCP	NO
IP ADDRESS	192.168. 0. 70
SUBNET MASK	255. 255. 255. 0
FILE SHARING	
USER NAME	Guest
DOMAIN	Workgroup
PS NAME	PC
DATA	
OUTPUT MODE	ACK
TIME OUT	5
STYLE SHEET	OFF

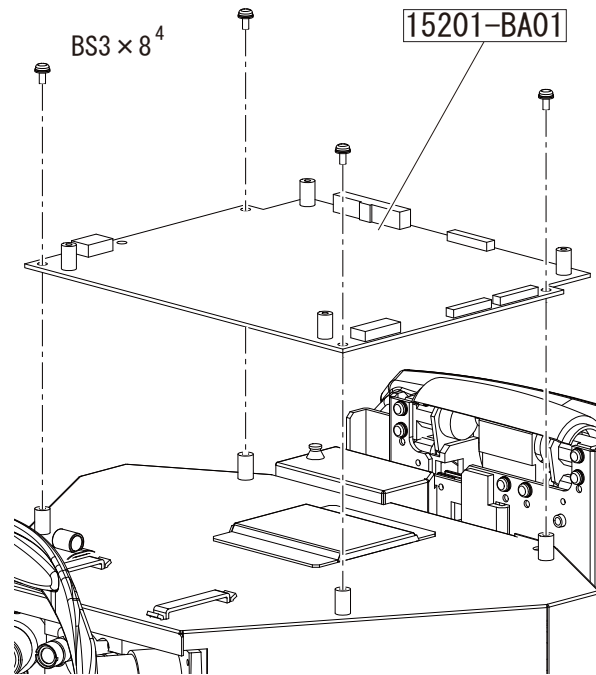
- 2 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).
- 3 . Disconnect all connectors from the main board (15201-BA01) and driver board (15201-BA02).



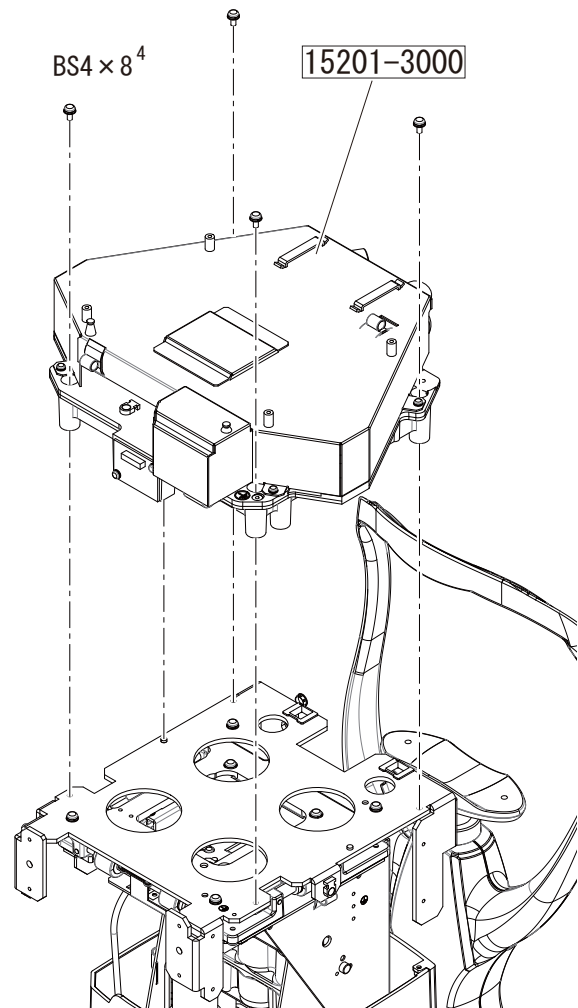
- 4 . Remove the driver board (15201-BA02) (see 7.2.2 [p92]).



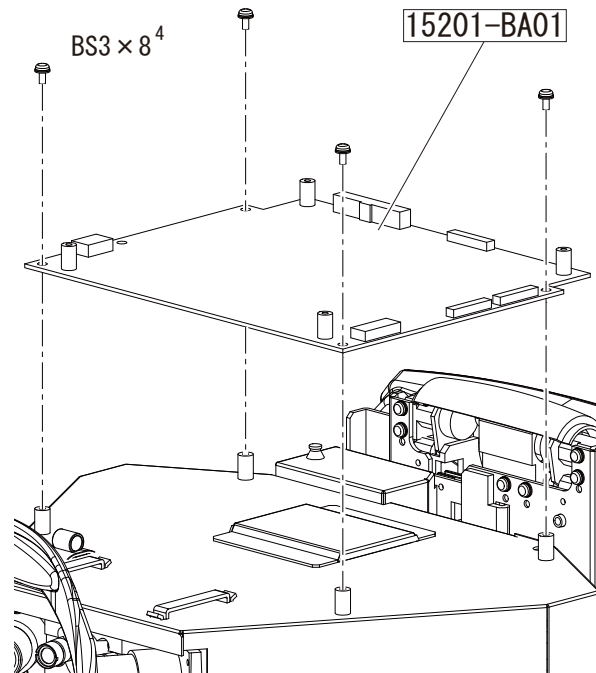
- 5 . Remove the main board (15201-BA01)  
(see 7.2.1 [p90]).



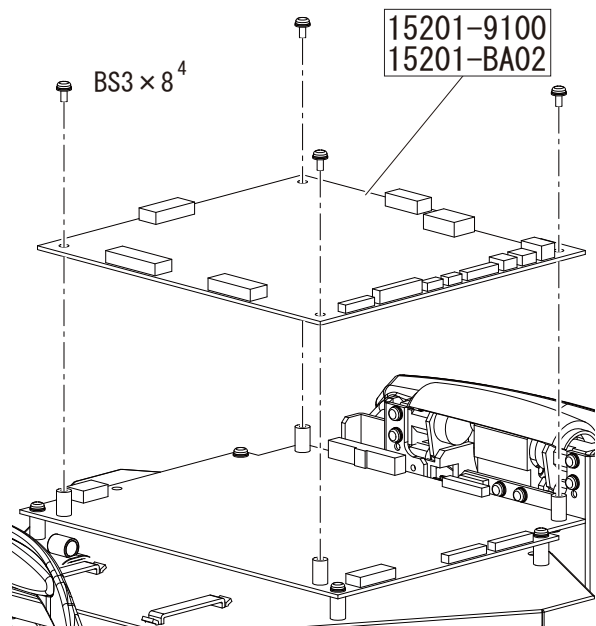
- 6 . Replace the capturing ASSY (15201-3000) along with the attached shading cover.



7 . Attach the main board (15201-BA01).



8 . Attach the provided driver board (15201-BA02) to the adjusted SM capturing ASSY (15201-9100).



9 . Reassemble the other parts in the reverse order.

10 . Check the assembly operation.

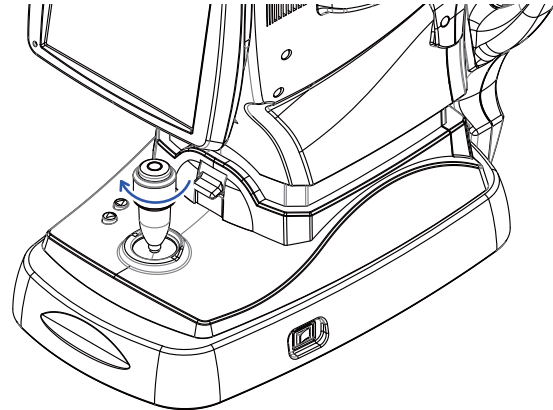
11 . Follow Step 2 of “8.4.3 Pachy calibration (p222)” to perform alignment calibration.

12 . According to the printed parameter data, enter the parameter settings (see 7.1.1.1 [p69], 8.6.7 [p262], 8.6.8 [p264], and 8.6.9 [p268]).

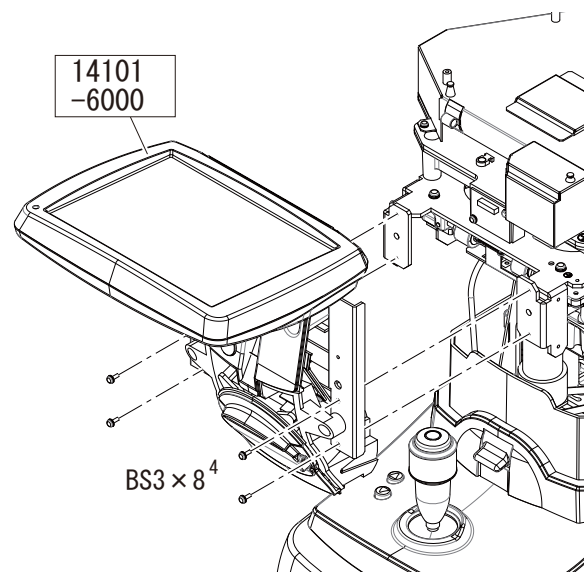
### 7.1.3 R/L motor ASSY (15201-2510)

#### Replacement part: 15201-2510

- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.

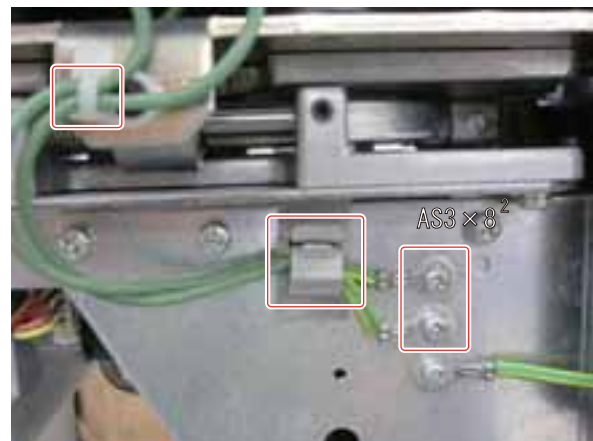


- 4 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

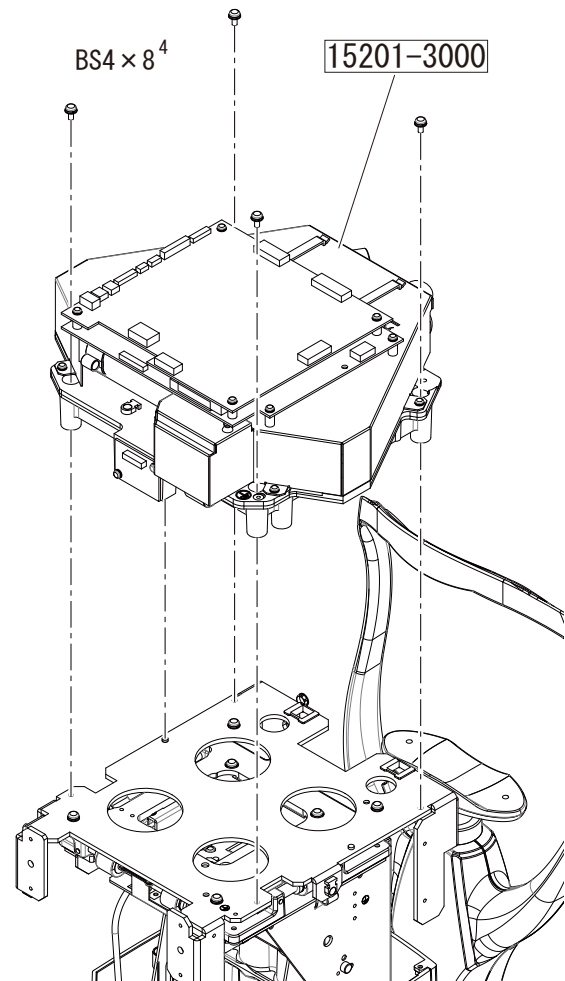


- 5 . Disconnect the cables.

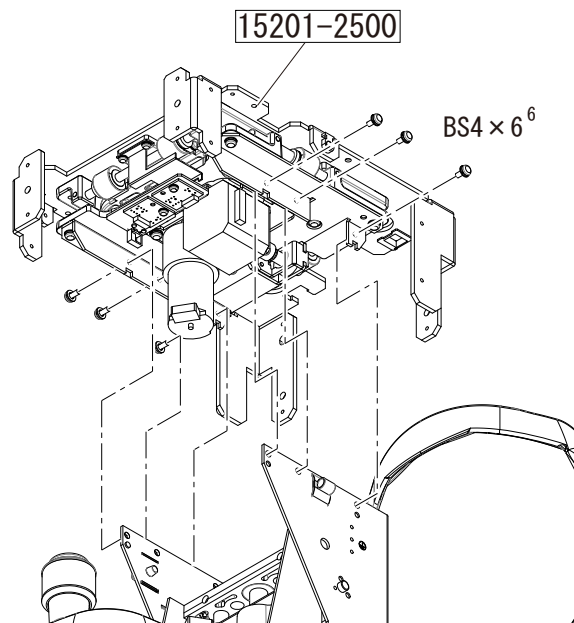
- 1 ) Unscrew AS3 x 8 (n = 2) from the F.GND1 cables (30601-EA80 [n = 2]).
- 2 ) Disconnect the F.GND1 cables (30601-EA80 [n = 2]).
- 3 ) Disconnect P102 (J2) from the main board (15201-BA01) (see 9.3 [p276] and 9.5.1 [p289]).
- 4 ) Disconnect P202 (J2), P203 (J3), and P204 (J4) from the driver board (15201-BA02) (see 9.3 [p276] and 9.5.1 [p289]).
- 5 ) Disconnect the connectors from the R/L motor ASSY (15201-2510), pulse motor (15201-E007) and TRC sensor boards (15201-BA11 [n = 2]) (see 9.3 [p276]).
- 6 ) Remove the clamps from the disconnected cables.



- 6 . Unscrew BS4 × 8 (n = 4) from the capturing ASSY (15201-3000).
- 7 . Remove the capturing ASSY (15201-3000).

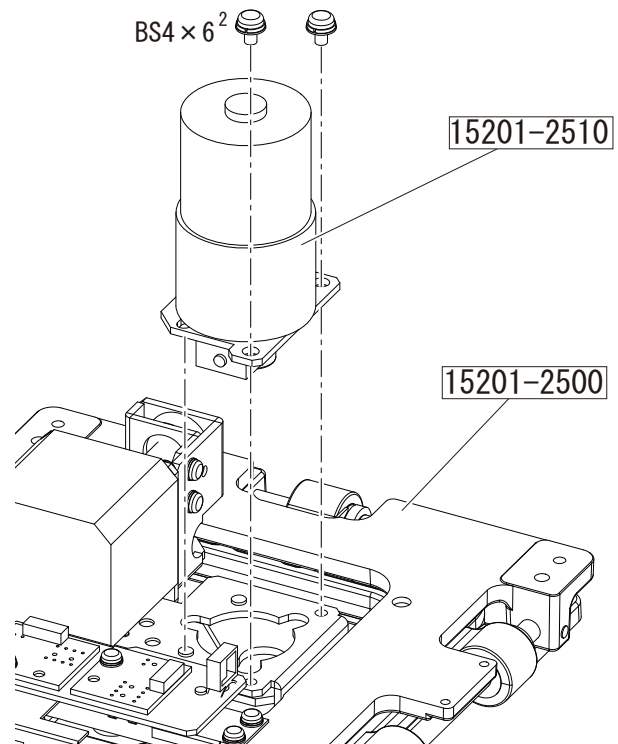


- 8 . Unscrew BS4 × 6 (n = 6) from the horizontal tracking ASSY (15201-2500).
- 9 . Remove the horizontal tracking ASSY (15201-2500).



10. Unscrew BS4 × 6 (n = 2) from the R/L motor ASSY (15201-2510).
11. Replace the R/L motor ASSY (15201-2510).

12. Reassemble the parts in the reverse order.
13. Perform the procedure as in “8.3.8 Tracking check” (p162).
14. Perform the procedure as in “8.4.1 Tracking adjustment (p211)” as necessary.
15. Check the assembly operation.

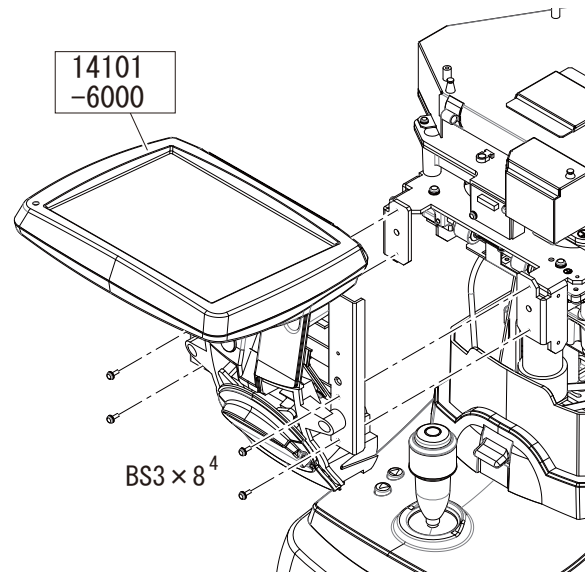




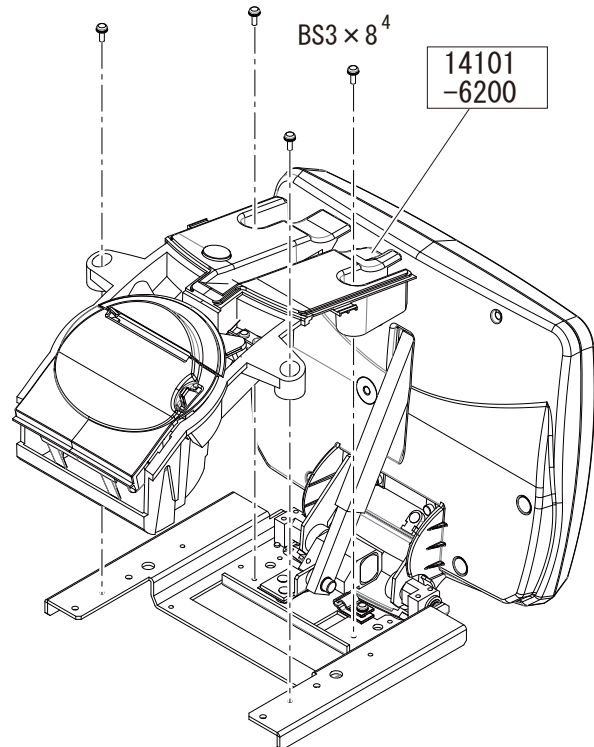
## 7.1.4 LCD ASSY (14101-6100)

### Replacement part: 14101-6100

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

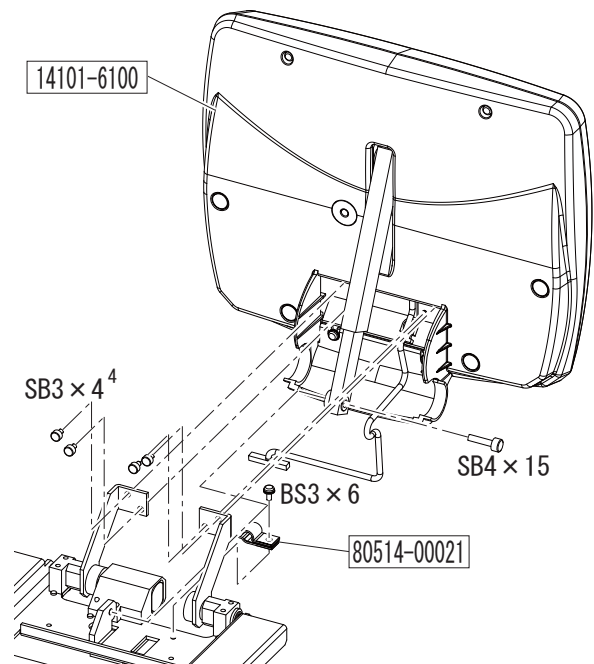


- 2 . Remove the printer ASSY (14101-6200) (see 6.3 [p56]).



- 3 . Unscrew BS3 × 6 to remove the FG clamp (80514-00021).
- 4 . Unscrew SB3 × 4 (n = 4) and SB4 × 15 from the LCD ASSY (14101-6100).
- 5 . Replace the LCD ASSY (14101-6100).

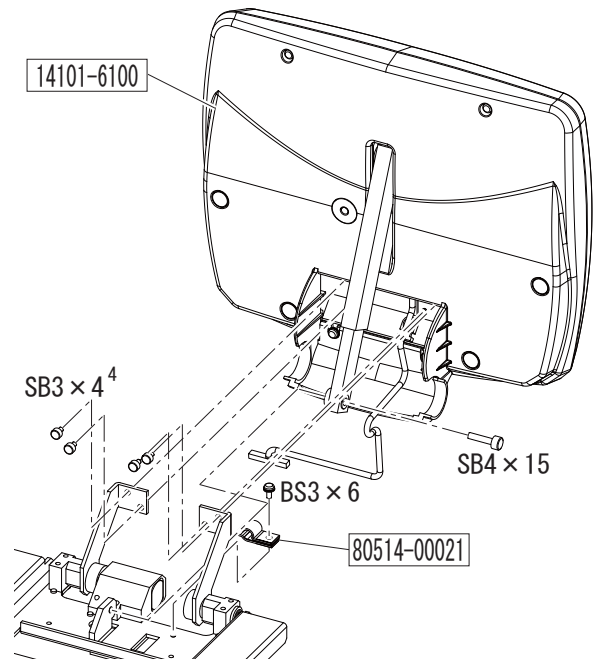
- 6 . Reassemble the parts in the reverse order.
- 7 . Check the assembly operation.
- 8 . Perform the touch panel calibration (see 8.4.4 [p236] and 8.6.4 [p258]).
- 9 . Perform the procedure as in “8.3.4 Touch panel check” (p156).



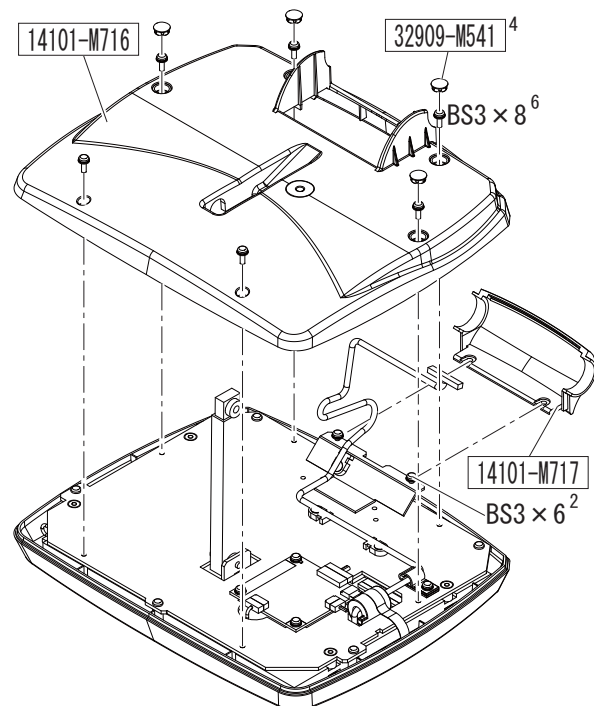
## 7.1.5 Pad-attached LCD ASSY (14101-6110)

### Replacement part: 14101-6110

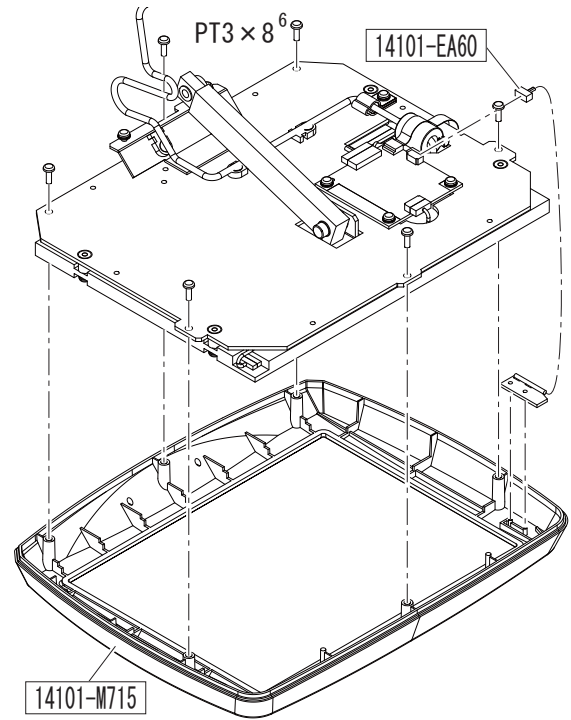
- 1 . Remove the LCD ASSY (14101-6100)  
(see 7.1.4 [p83]).



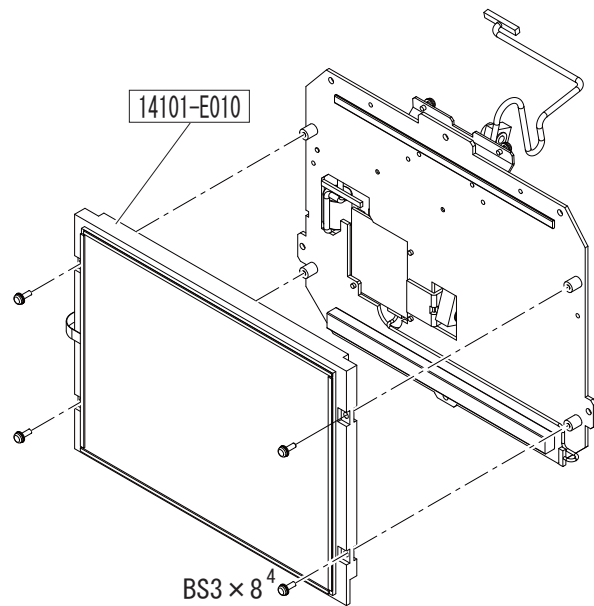
- 2 . Remove the caps (32909-M541 [n = 4]).
- 3 . Unscrew BS3 x 8 (n = 6) to remove the LCD rear cover (14101-M716).
- 4 . Loosen BS3 x 6 (n = 2) to remove the joint cover (14101-M717).



- 5 . Unscrew PT3 × 8 (n = 6) to remove the LCD bezel (14101-M715).
- 6 . Disconnect P603 (J3) from the LCD board (14101-BA06) to remove the power LED (14101-EA60).
- 7 . Disconnect J4 from the LCD board (14101-BA06).
- 8 . Disconnect P001 (CN1) and P003 (CN2) from the LCD (14101-E010).



- 9 . Unscrew BS3 × 8 (n = 4) to replace the pad-attached LCD ASSY (14101-6110).

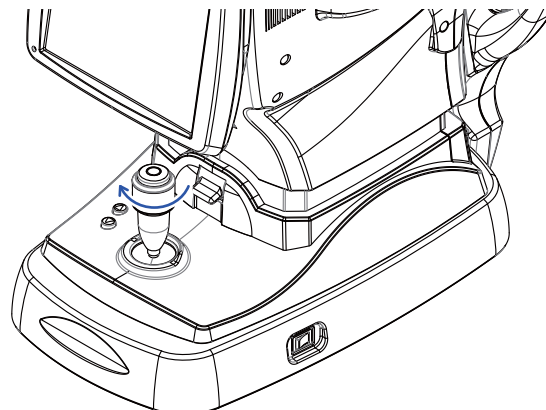


10. Reassemble the parts in the reverse order.
11. Check the assembly operation.
12. Perform the touch panel calibration (see 8.4.4 [p236] and 8.6.4 [p258]).
13. Perform the procedure as in “8.3.4 Touch panel check” (p156).

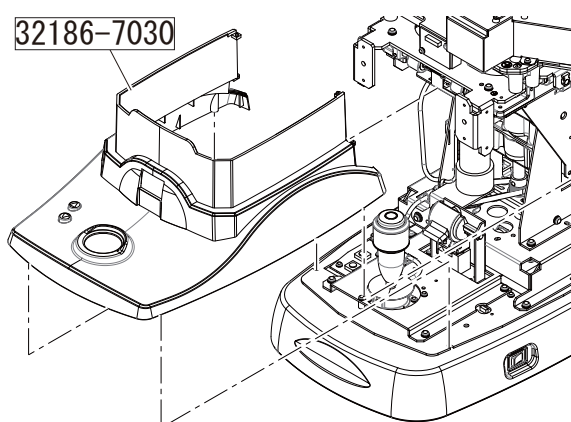
## 7.1.6 Joystick ASSY (10701-1260)

### Replacement part: 10701-1260

- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 5 . Disconnect P902 (J2) from the U/D SW board (30601-BA09).
- 6 . Release the clamp from the cables of the joystick ASSY (10701-1260).

- 7 . Disconnect the GND cable of the joystick ASSY (10701-1260) from the body bracket (30601-M203).

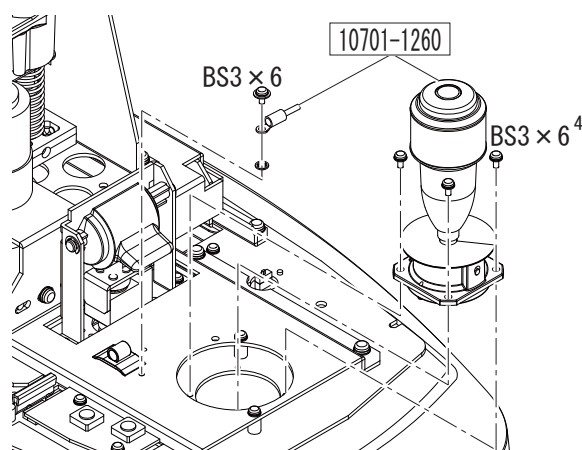
1 ) Unscrew BS3 × 6.

- 8 . Unscrew BS3 × 6 (n = 4) from the joystick ASSY (10701-1260).

- 9 . Replace the joystick ASSY (10701-1260).

- 10 . Reassemble the parts in the reverse order.

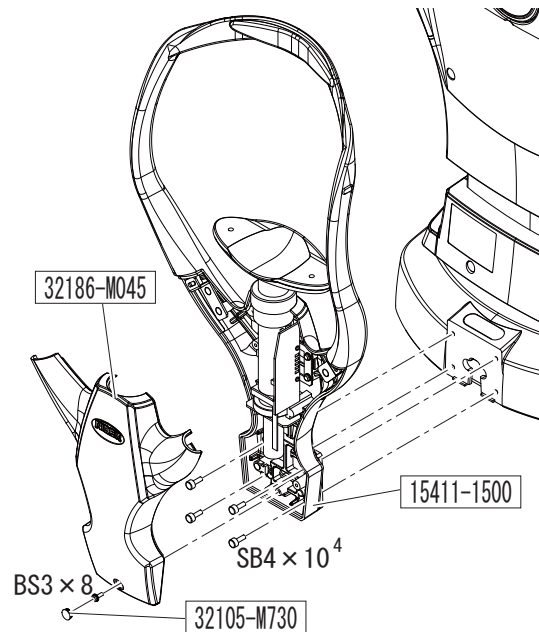
- 11 . Check the assembly operation.



## 7.1.7 Patient positioning ASSY (15411-1500)

### Replacement part: 15411-1500

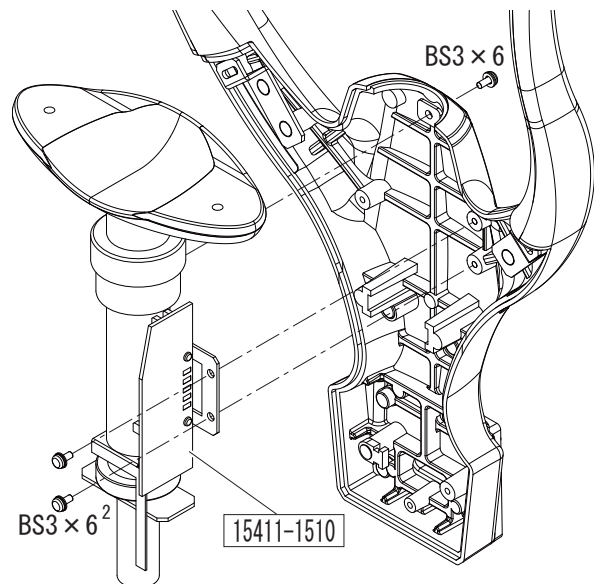
- 1 . Remove the caps (32105-M730 [n = 4]).
- 2 . Unscrew BS3 × 8 from the chinrest cover (32186-M045).
- 3 . Remove the chinrest cover (32186-M045).
- 4 . Disconnect P004 (J004) from the chinrest (32186-EA53).
- 5 . Unscrew SB4 × 10 (n = 4) from the patient positioning ASSY (15411-1500).
- 6 . Replace the patient positioning ASSY (15411-1500).
- 7 . Reassemble the parts in the reverse order.
- 8 . Check the assembly operation.



## 7.1.8 Chinrest ASSY (15411-1510)

### Replacement part: 15411-1510

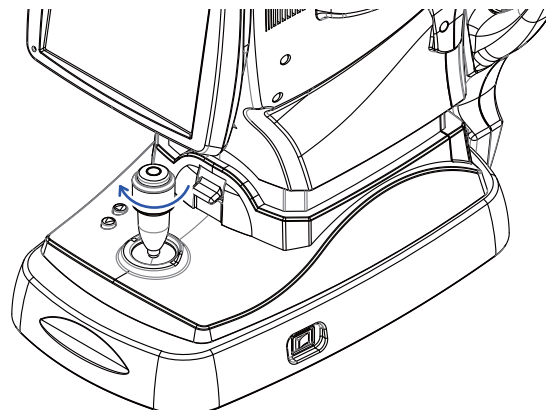
- 1 . Remove the patient positioning ASSY (15411-1500) (see 7.1.8 [p88]).
- 2 . Unscrew BS3 × 6 (n = 3) from the chinrest ASSY (15411-1510).
- 3 . Replace the chinrest ASSY (15411-1510).
- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.



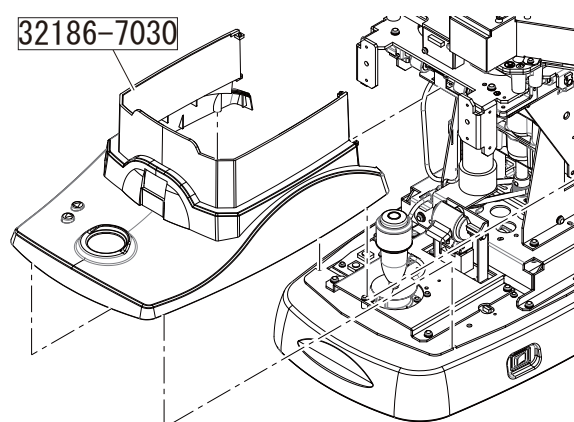
## 7.1.9 Brake ASSY (30601-2300)

### Replacement part: 30601-2300

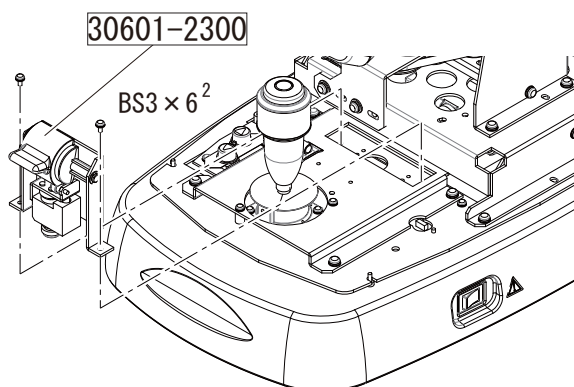
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 5 . Unscrew BS3 × 6 (n = 2) from the brake ASSY (30601-2300) to the body bracket (32186-M203).
- 6 . Replace the brake ASSY (30601-2300).



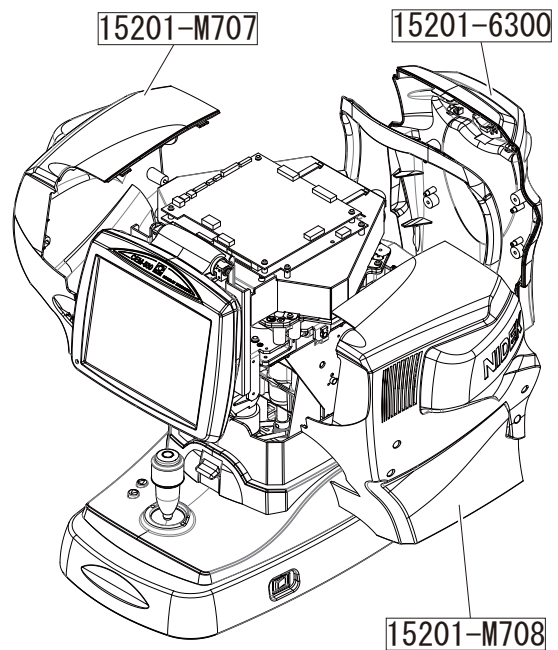
- 7 . Reassemble the parts in the reverse order.
- 8 . Check the assembly operation.

## 7.2 Boards

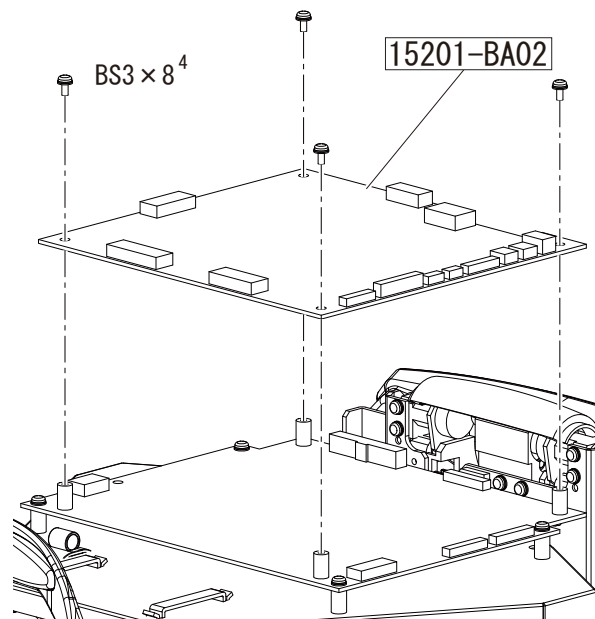
### 7.2.1 Main board (15201-BA01)

**Replacement part: 15201-BA01 (see 9.7.1 [p296])**

- 1 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).



- 2 . Remove the driver board (15201-BA02) (see 7.2.2 [p92]).

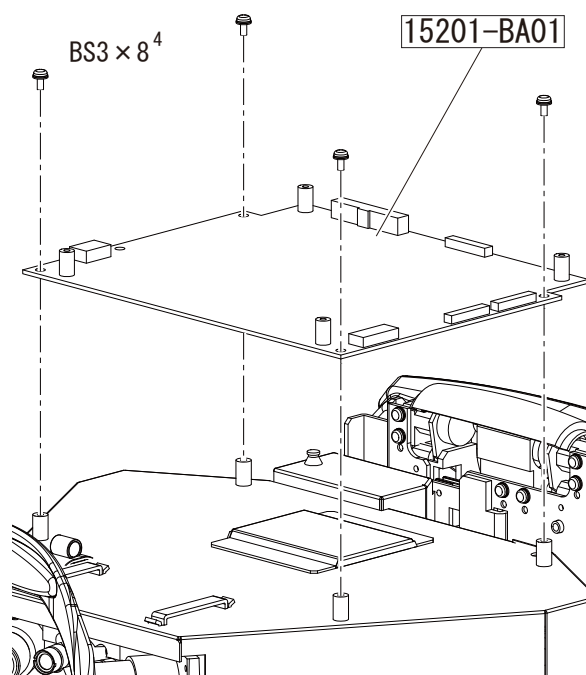


- 3 . Disconnect the connectors from the main board (15201-BA01) (see 9.5.1 [p289]).



- 4 . Unscrew BS3 × 8 (n = 4) from the main board (15201-BA01).
- 5 . Replace the main board (15201-BA01).

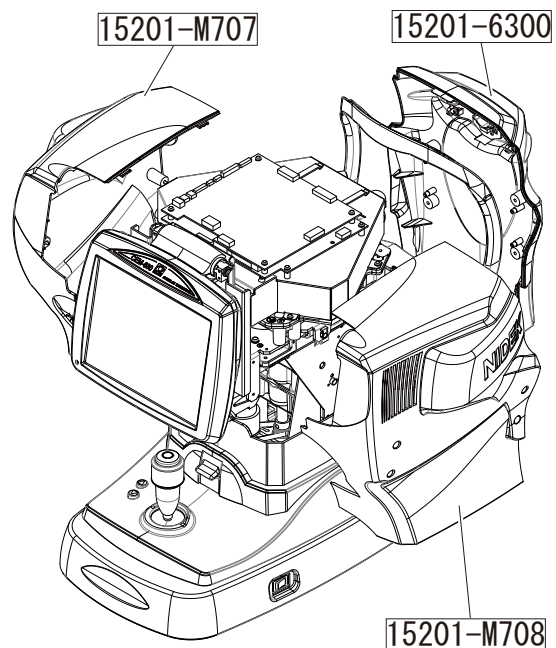
- 6 . Reassemble the parts in the reverse order.
- 7 . Perform the calibration (see 8.4 [p211]).
- 8 . Set the parameters (see 8.6 [p244]).
- 9 . Check the assembly operation.



## 7.2.2 Driver board (15201-BA02)

### Replacement part: 15201-BA02 (see 9.7.1 [p296])

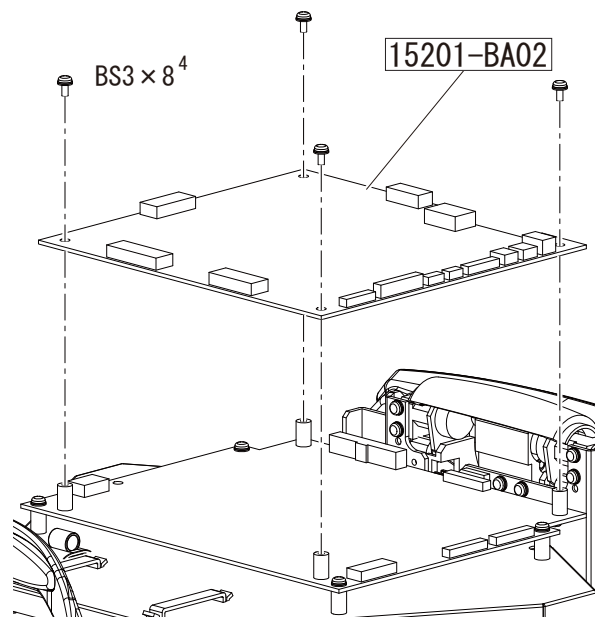
- 1 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).



- 2 . Disconnect all connectors from the driver board (15201-BA02) (see 9.5.2 [p291]).

- 3 . Unscrew BS3 × 8 (n = 4) from the driver board (15201-BA02).

- 4 . Replace the driver board (15201-BA02).

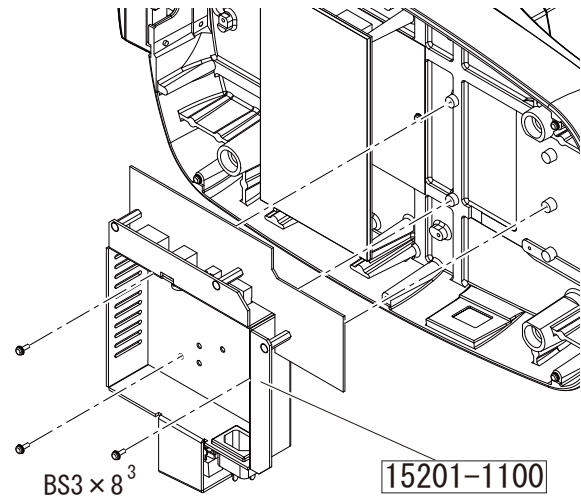


- 5 . Reassemble the parts in the reverse order.
- 6 . Perform the procedure as in “8.5.3 Adjustment data recovery” (p242).
- 7 . Perform the calibration (see 8.4 [p211]).
- 8 . Set the parameters (see 8.6 [p244]).
- 9 . Check the assembly operation.

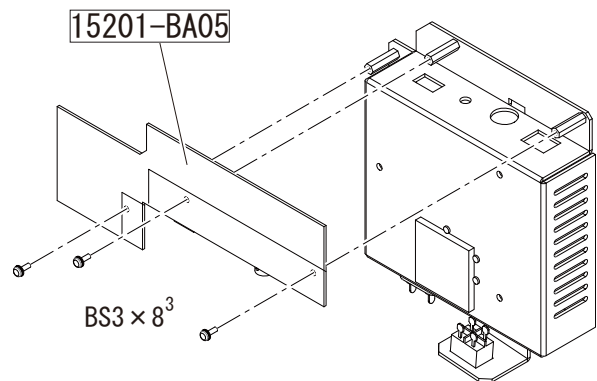
## 7.2.3 Base board (15201-BA05)

**Replacement part: 15201-BA05 (see 9.7.1 [p296])**

- 1 . Remove the primary power source (15201-EA01) (see 7.3.1 [p104]).



- 2 . Unscrew BS3 x 8 (n = 3) from the base board (15201-BA05).
- 3 . Replace the base board (15201-BA05).

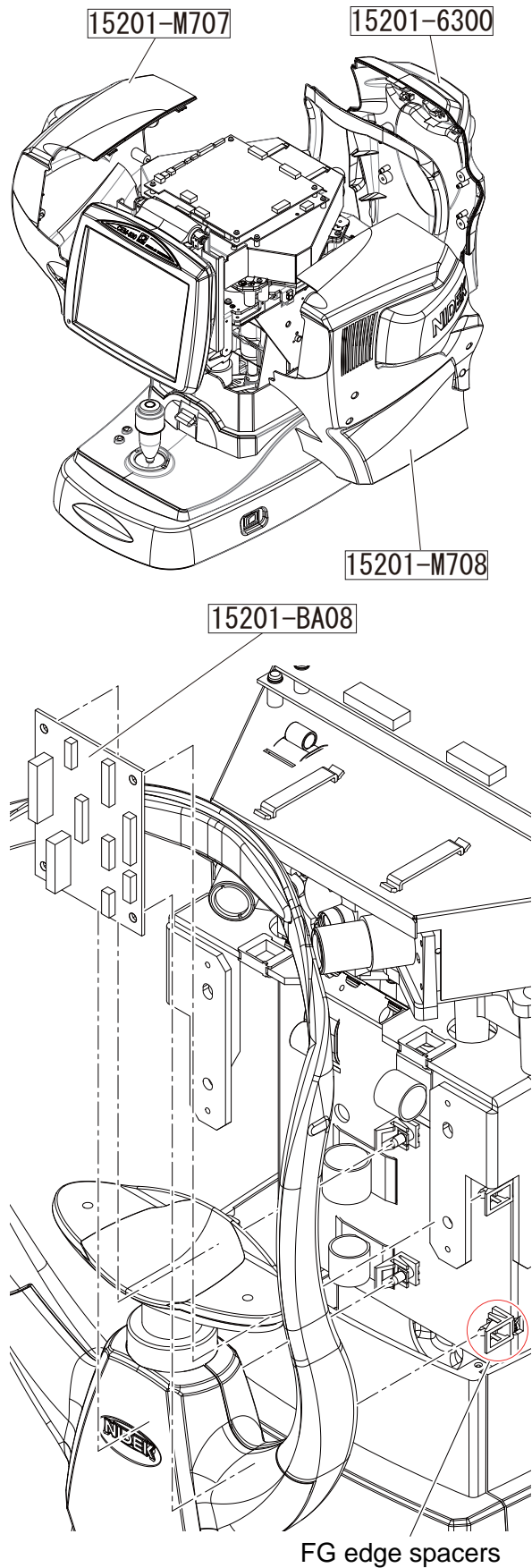


- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.

## 7.2.4 Connection board (15201-BA08)

### Replacement part: 15201-BA08 (see 9.7.1 [p296])

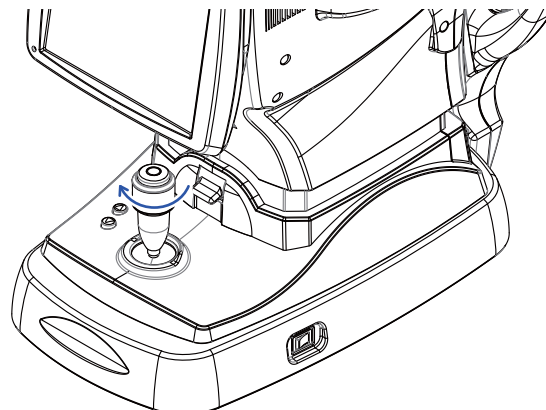
- 1 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).
- 2 . Disconnect all connectors from the connection board (15201-BA08) (see 9.3 [p276], 9.4 [p277], and 9.5.3 [p293]).
- 3 . Open the FG edge spacers (804-75-01116 [n = 4]) from the connection board (15201-BA08).
- 4 . Replace the connection board (15201-BA08).
- 5 . Reassemble the parts in the reverse order.
- 6 . Check the assembly operation.



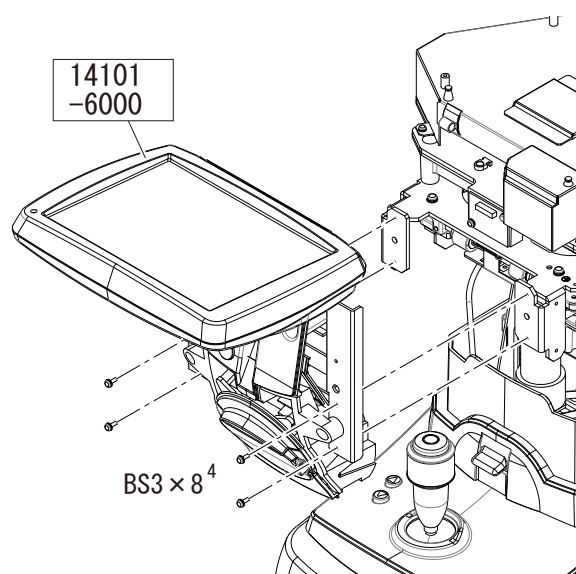
## 7.2.5 TRC sensor board (15201-BA11) for right/left movement

**Replacement part: 15201-BA11 (see 9.7.1 [p296])**

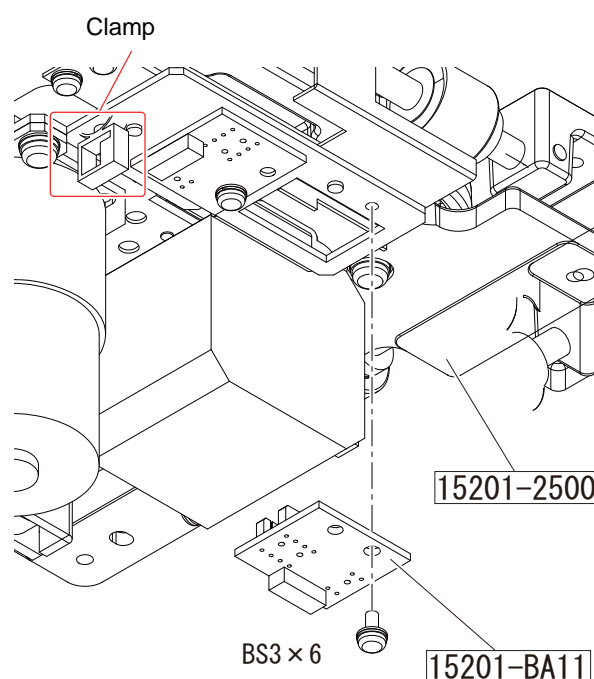
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 5 . Release the clamp fastening the cables.
- 6 . Disconnect P1101 from the TRC sensor board (15201-BA11) (see 9.5.3 [p293]).
- 7 . Unscrew BS3 x 6 from the TRC sensor board (15201-BA11).
- 8 . Replace the TRC sensor board (15201-BA11).

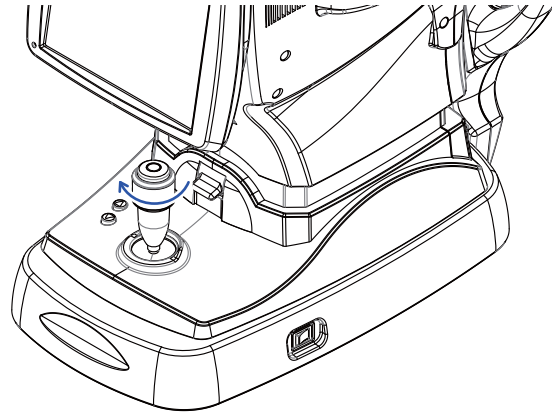


- 9 . Reassemble the parts in the reverse order.
- 10 . Check the assembly operation.

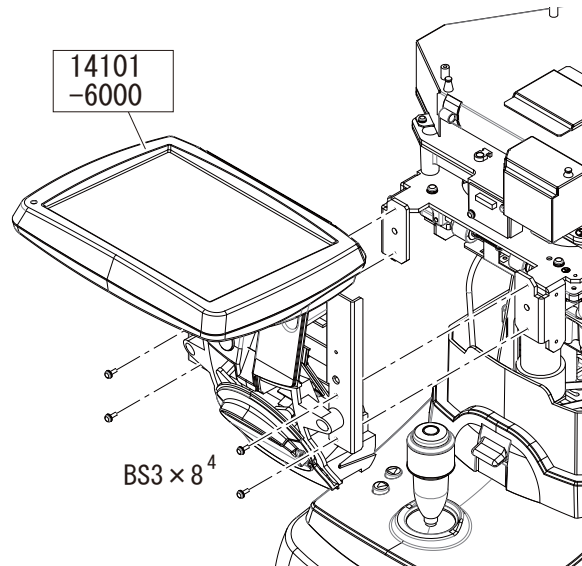
## 7.2.6 TRC sensor board (15201-BA11) for forward/backward movement

### Replacement part: 15201-BA11 (see 9.7.1 [p296])

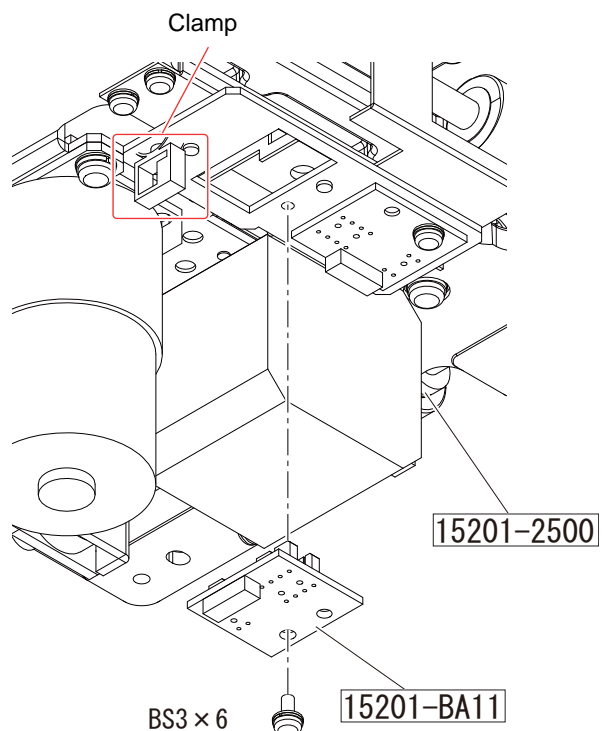
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 5 . Release the clamp fastening the cables.
- 6 . Disconnect P1101 from the TRC sensor board (15201-BA11) (see 9.5.3 [p293]).
- 7 . Unscrew BS3 x 6 from the TRC sensor board (15201-BA11).
- 8 . Replace the TRC sensor board (15201-BA11).

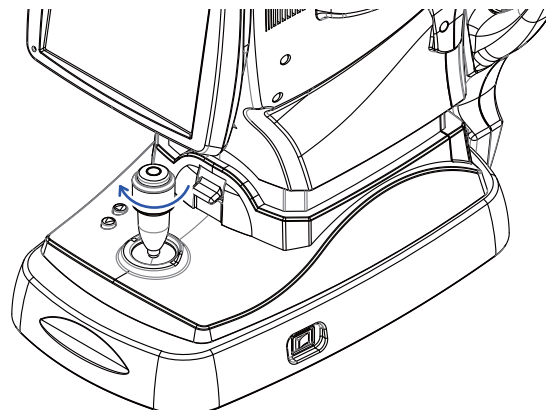


- 9 . Reassemble the parts in the reverse order.
- 10 . Check the assembly operation.

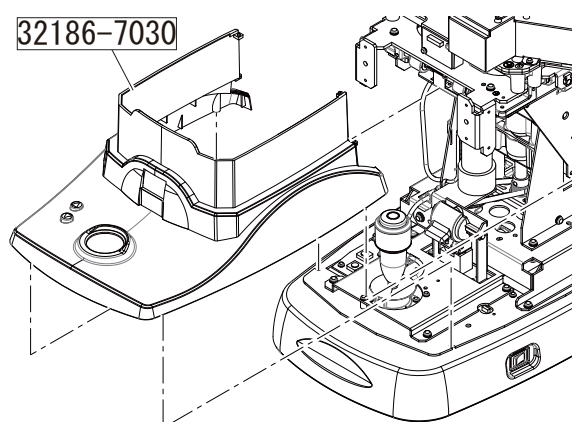
## 7.2.7 TRC sensor board (15201-BA11) for up/down movement

**Replacement part: 15201-BA11 (see 9.7.1 [p296])**

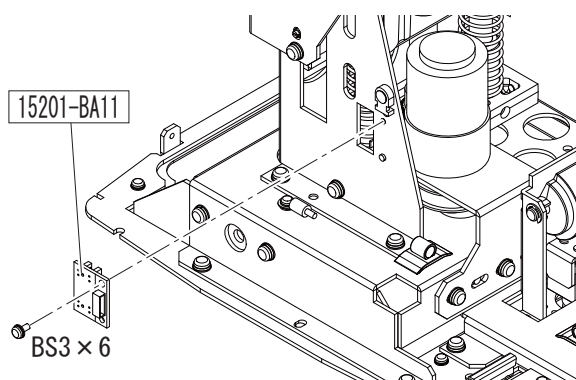
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).
- 5 . Release the clamp fastening the cables.



- 6 . Disconnect P1101 from the TRC sensor board (15201-BA11) (see 9.5.3 [p293]).
- 7 . Unscrew BS3 × 6 from the TRC sensor board (15201-BA11).
- 8 . Replace the TRC sensor board (15201-BA11).



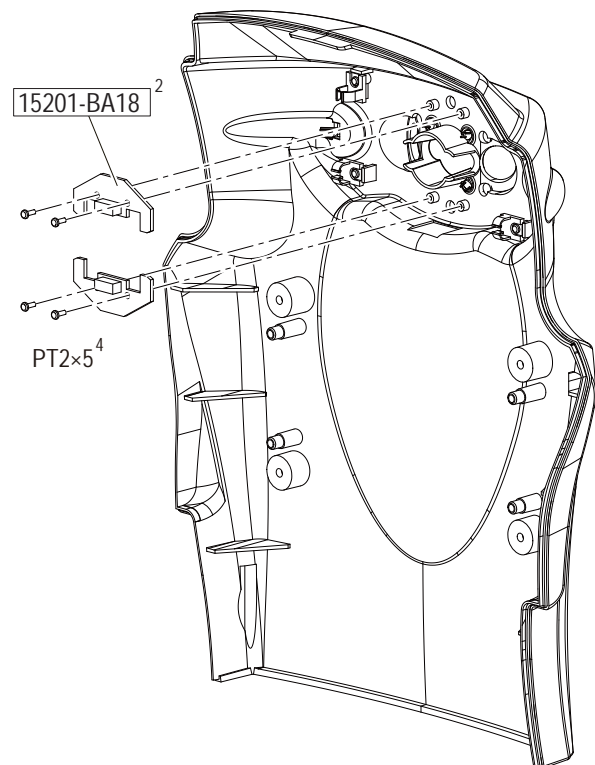
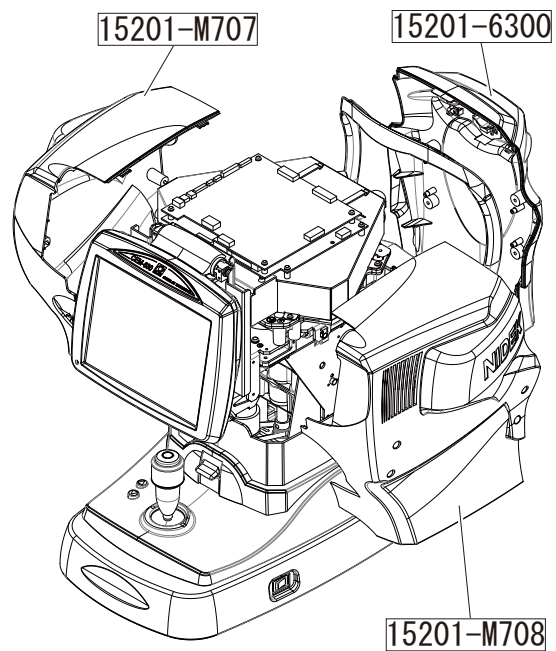
- 9 . Reassemble the parts in the reverse order.
- 10 . Check the assembly operation.



## 7.2.8 Peripheral fixation lamp board (15201-BA18)

**Replacement part: 15201-BA18 (see 9.7.1 [p296])**

- 1 . Remove the capturing unit front cover ASSY (15201-6300), capturing unit left cover (15201-M707), and capturing unit right cover (15201-M708) (see 6.1 [p53]).
- 2 . Disconnect P1801 from the peripheral fixation lamp board (15201-BA18) (see 9.5.3 [p293]).
- 3 . Unscrew PT2 × 5 (n = 4) from the peripheral fixation lamp board (15201-BA18).
- 4 . Replace the peripheral fixation lamp board (15201-BA18).
- 5 . Reassemble the parts in the reverse order.
- 6 . Check the assembly operation.

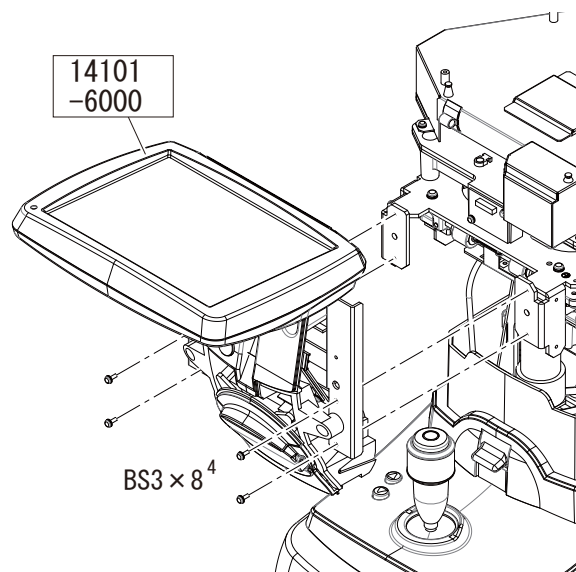




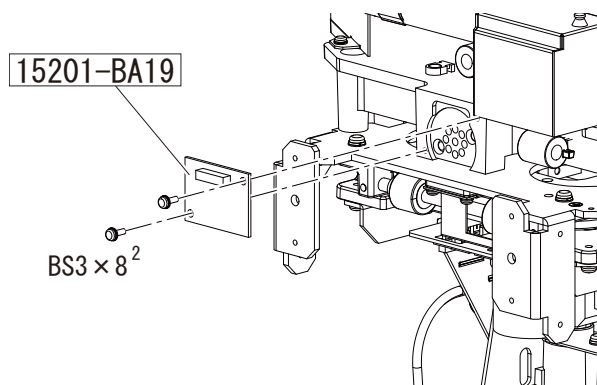
## 7.2.9 Fixation lamp board (15201-BA19)

**Replacement part: 15201-BA19 (see 9.7.1 [p296])**

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 2 . Disconnect P1901 from the fixation lamp board (15201-BA19) (see 9.5.3 [p293]).
- 3 . Unscrew BS3 x 8 (n = 2) from the fixation lamp board (15201-BA19).
- 4 . Replace the fixation lamp board (15201-BA19).

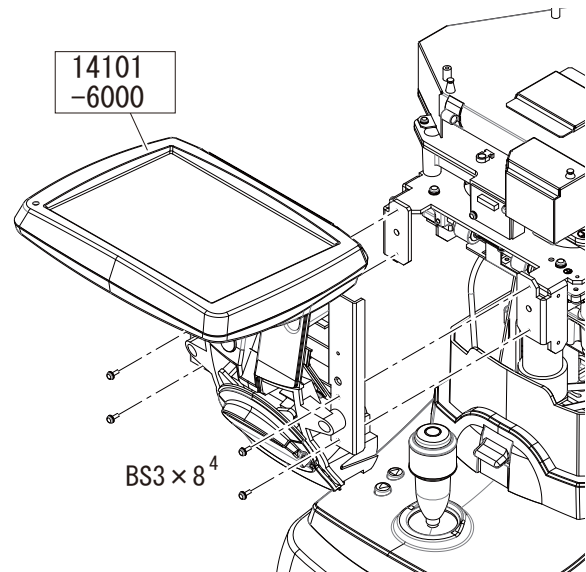


- 5 . Reassemble the parts in the reverse order.
- 6 . Check the assembly operation.

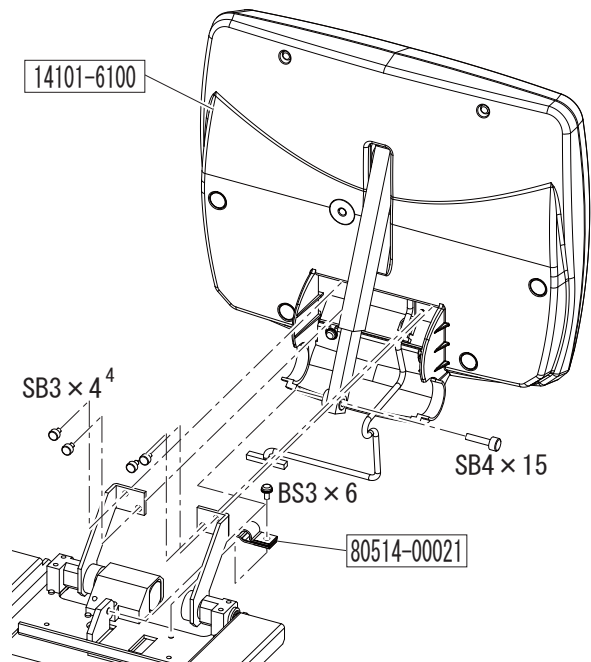
## 7.2.10 LCD board (14101-BA06)

**Replacement part: 14101-BA06 (see 9.7.1 [p296])**

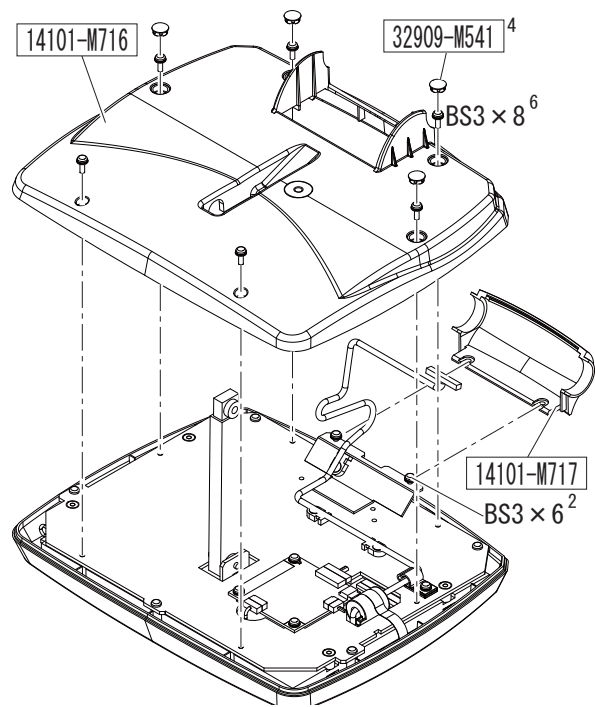
- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



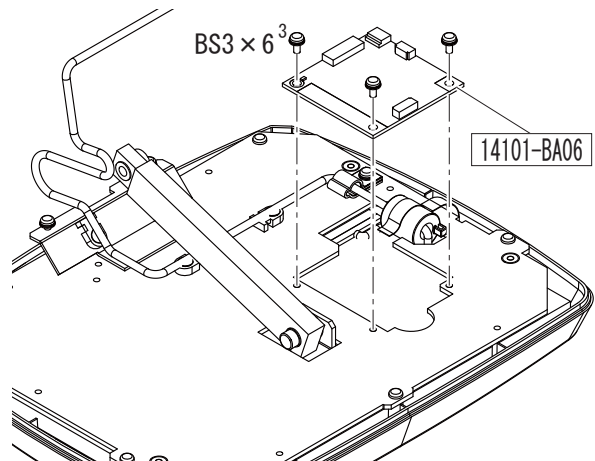
- 2 . Remove the LCD ASSY (14101-6100) (see 7.1.4 [p83]).



- 3 . Remove the caps (32909-M541 [n = 4]).
- 4 . Unscrew BS3 × 8 (n = 6) to remove the LCD rear cover (14101-M716).
- 5 . Loosen BS3 × 6 (n = 2) to remove the joint cover (14101-M717).
- 6 . Disconnect all connectors from the LCD board (14101-BA06).



- 7 . Unscrew BS3 × 6 (n = 3) from the LCD board (14101-BA06).
- 8 . Replace the LCD board (14101-BA06).

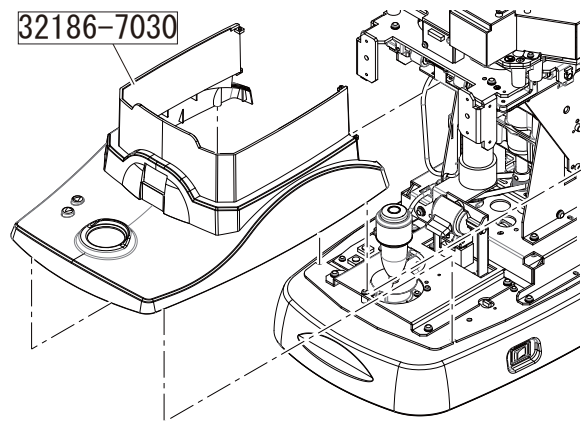


- 9 . Reassemble the parts in the reverse order.
- 10 . Check the assembly operation.

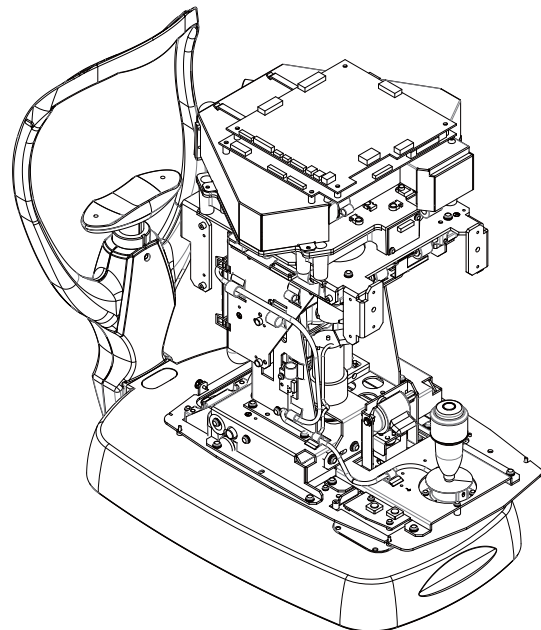
## 7.2.11 F/R/L sensor board (18536-BA25)

**Replacement part: 18536-BA25 (see 9.7.1 [p296])**

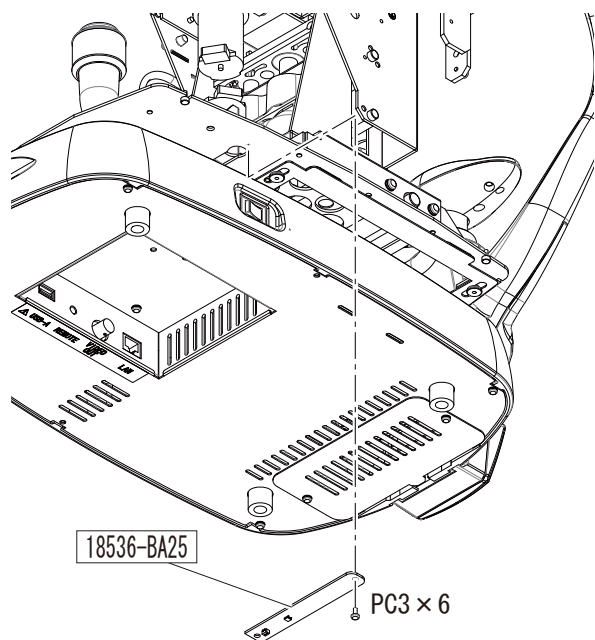
- 1 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).
- 2 . Disconnect P2501 from the F/R/L sensor board (18536-BA25) (see 9.5.3 [p293]).



- 3 . Move the capturing unit to the front right.



- 4 . Unscrew PC3 × 6 from the F/R/L sensor board (18536-BA25).
- 5 . Replace the F/R/L sensor board (18536-BA25).

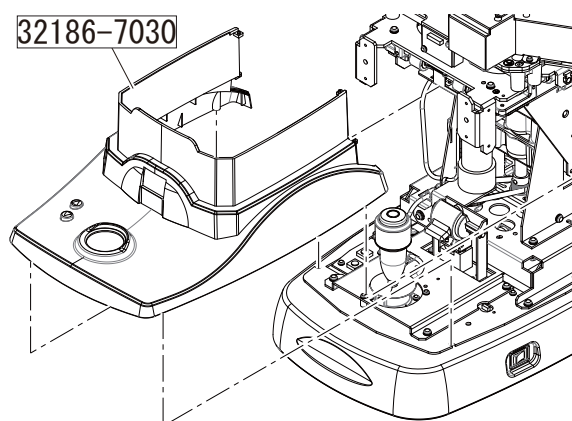


- 6 . Reassemble the parts in the reverse order.
- 7 . Check the assembly operation.

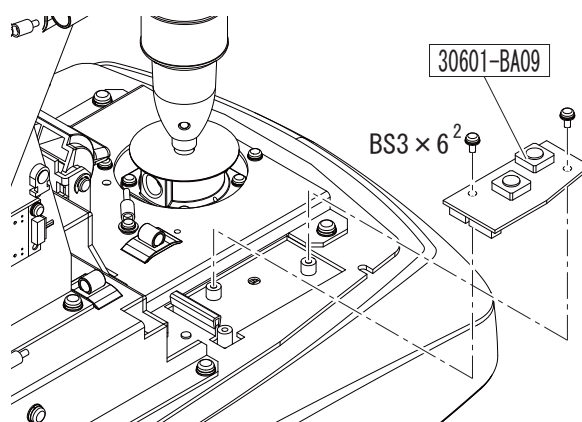
## 7.2.12 U/D SW board (30601-BA09)

**Replacement part: 30601-BA09 (see 9.7.1 [p296])**

- 1 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 2 . Unscrew BS3 × 6 (n = 2) from the U/D SW board (30601-BA09).
- 3 . Disconnect P901 (J1) and P902 (J2) from the U/D SW board (30601-BA09).
- 4 . Replace the U/D SW board (30601-BA09).



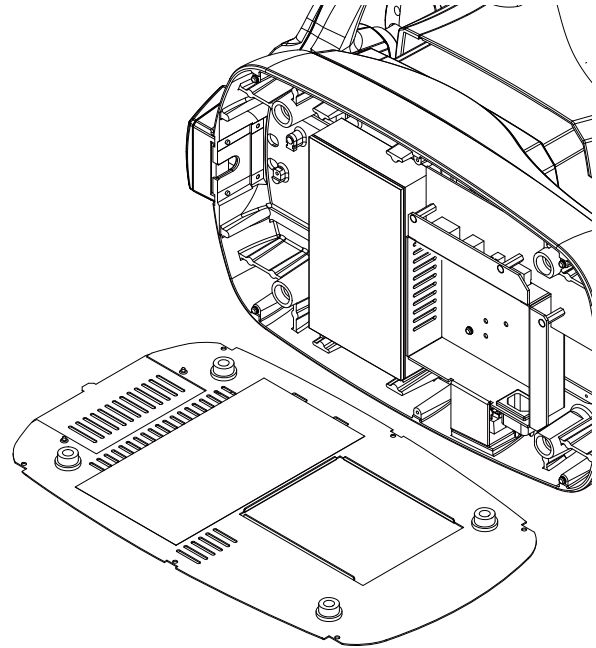
- 5 . Reassemble the parts in the reverse order.
- 6 . Check the assembly operation.

## 7.3 Electrical Components

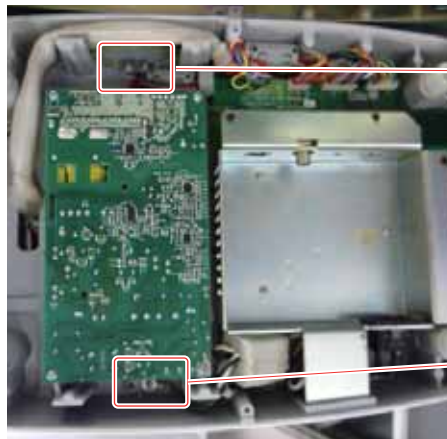
### 7.3.1 Primary power source (15201-EA01)

**Replacement part: 15201-EA01 (see 9.7.2 [p298])**

- 1 . Disconnect all cables from the device.
- 2 . Remove the bottom plate (30601-M002)  
(see 6.6 [p60]).



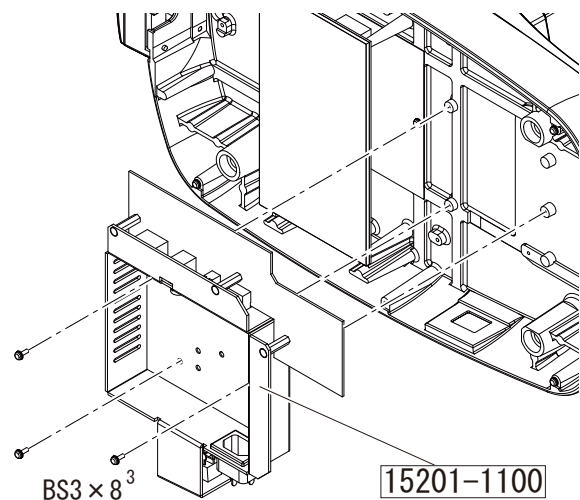
- 3 . Unscrew AS3 × 6 (n = 2) from the ground cable.



- 4 . Unscrew BS3 × 8 (n = 3) from the inlet ASSY (15201-1100).
- 5 . Remove the inlet ASSY (15201-1100).

	<b>Caution</b> Do not pull out the ASSY forcibly as the cables are connected.
--	-------------------------------------------------------------------------------

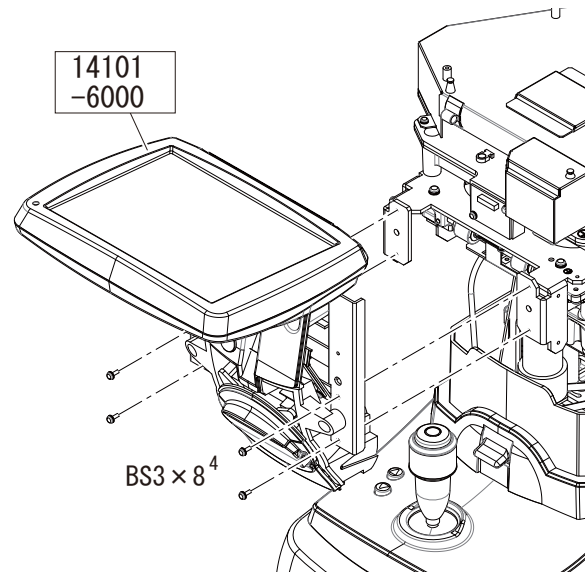
- 6 . Disconnect P501, P502, P503, and P504 from the base board (15201-BA05) (see 9.3 [p276] and 9.4 [p277]).
- 7 . Replace the primary power source (15201-EA01).
- 8 . Reassemble the parts in the reverse order.
- 9 . Check the assembly operation.



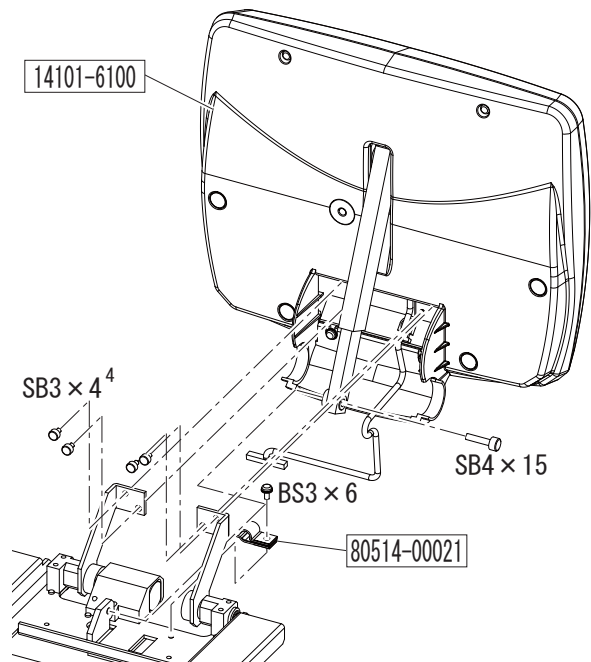
## 7.3.2 Power LED (14101-EA60)

**Replacement part: 14101-EA60 (see 9.7.1 [p296])**

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).

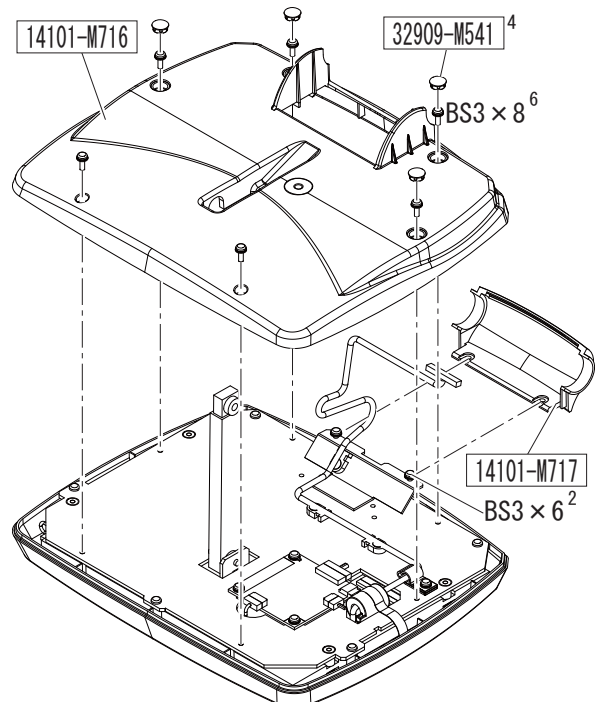


- 2 . Remove the LCD ASSY (14101-6100) (see 7.1.4 [p83]).

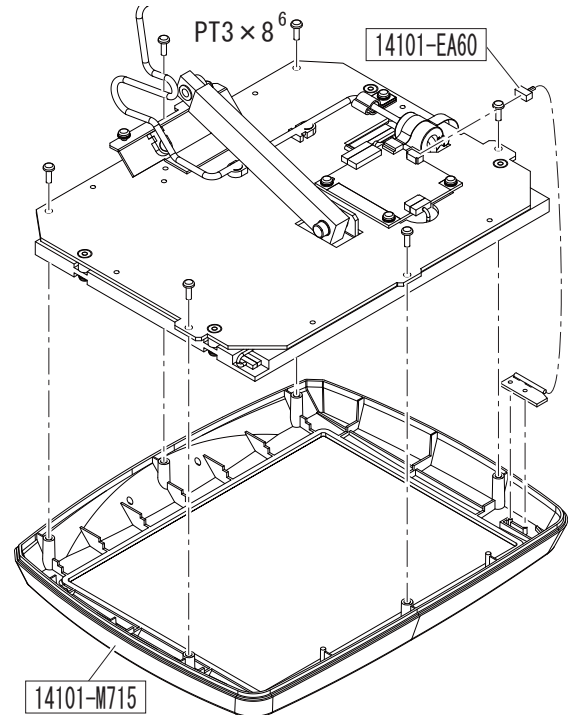




- 3 . Remove the caps (32909-M541 [n = 4]).
- 4 . Unscrew BS3 × 8 (n = 6) to remove the LCD rear cover (14101-M716).
- 5 . Loosen BS3 × 6 (n = 2) to remove the joint cover (14101-M717).



- 6 . Unscrew PT3 × 8 (n = 6) from the LCD bezel (14101-M715).
- 7 . Remove the LCD bezel (14101-M715).
- 8 . Disconnect P603 from the LCD board (14101-BA06).
- 9 . Replace the power LED (14101-EA60).



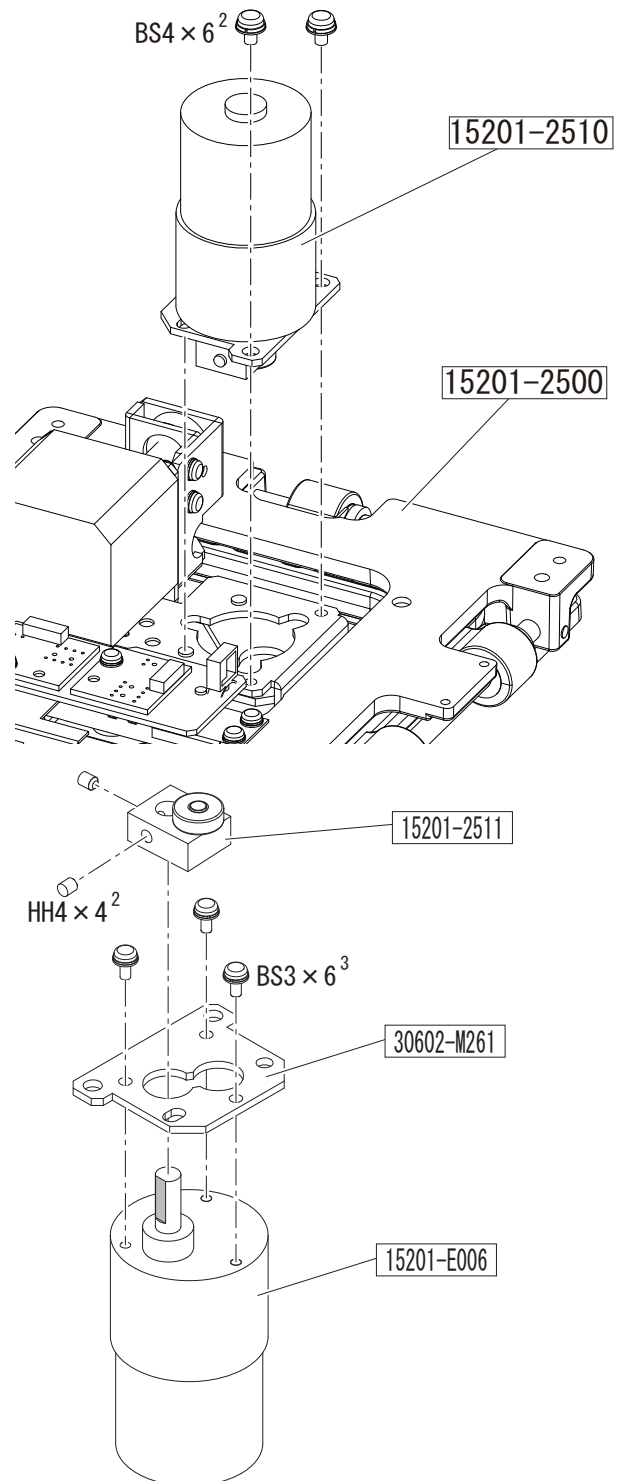
- 10 . Reassemble the parts in the reverse order.
- 11 . Check the assembly operation.



### 7.3.3 Brushless geared motor (15201-E006)

#### Replacement part: 15201-E006

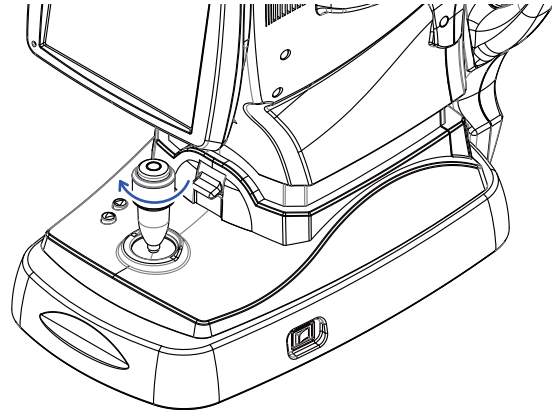
- 1 . Remove the R/L motor ASSY (15201-2510) (see 7.1.3 [p80]).
- 2 . Disconnect the connectors from the brushless geared motor (15201-E006).
- 3 . Loosen HH4 × 4 (n = 2) to remove the crank ASSY (15201-2511).
- 4 . Unscrew BS3 × 6 (n = 3) from the motor attachment plate (30602-M261).
- 5 . Replace the brushless geared motor (15201-E006).
- 6 . Reassemble the parts in the reverse order.
- 7 . Perform the procedure as in “8.3.8 Tracking check” (p162).
- 8 . Perform the procedure as in “8.4.1 Tracking adjustment (p211)” as necessary.



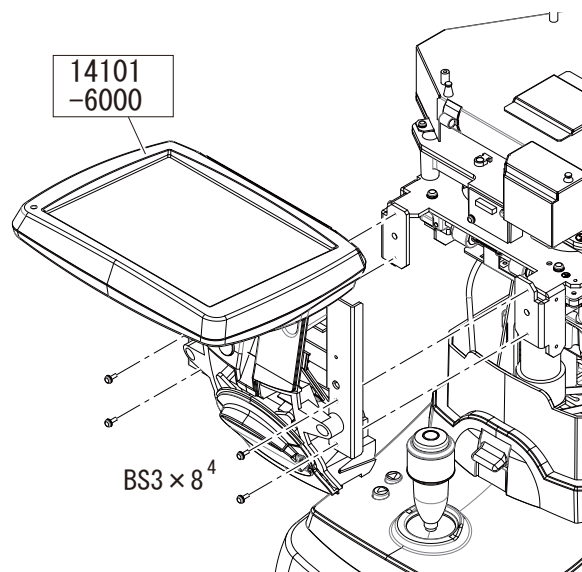
### 7.3.4 Pulse motor (15201-E007)

#### Replacement part: 15201-E007

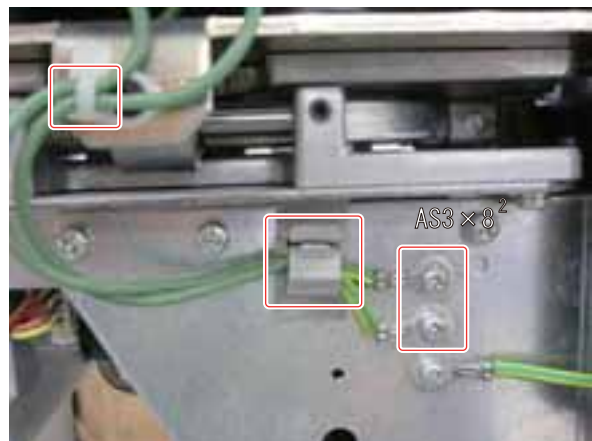
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



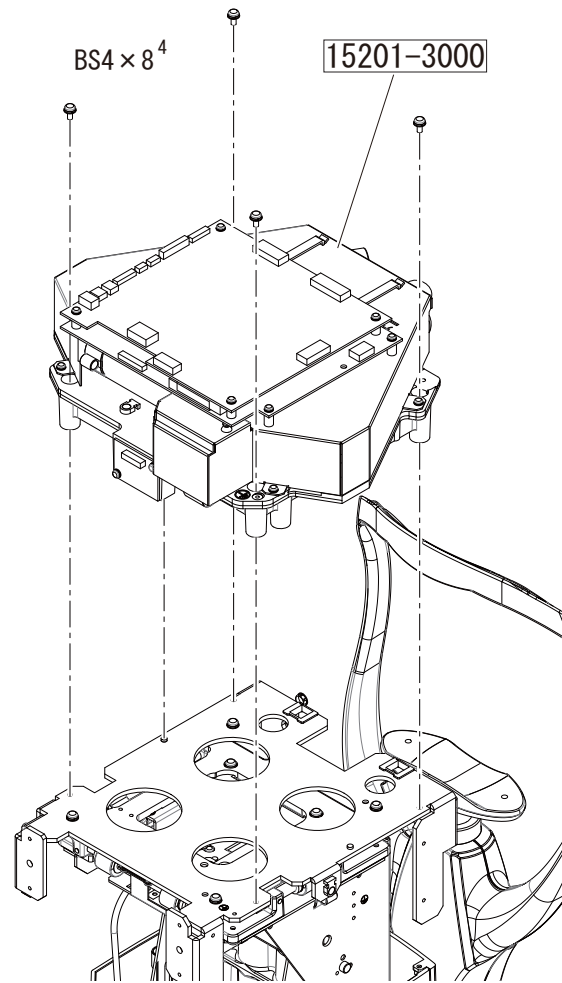
- 4 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



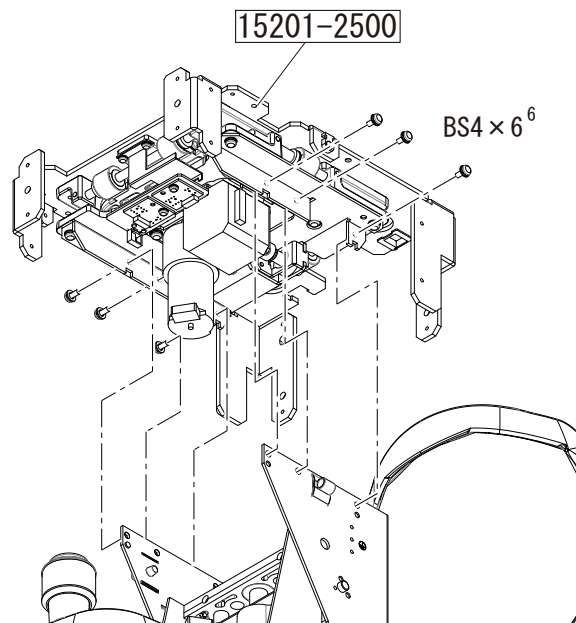
- 5 . Disconnect the cables as follows:
  - 1 ) Unscrew AS3 x 6 (n = 2).
  - 2 ) Disconnect the F.GND1 cables (30601-EA80 [n = 2]).
  - 3 ) Disconnect P102 (J2) from the main board (15201-BA01) (see 9.3 [p276] and 9.5.1 [p289]).
  - 4 ) Disconnect P202 (J2), P203 (J3), and P204 (J4) from the driver board (15201-BA02) (see 9.3 [p276] and 9.5.1 [p289]).
  - 5 ) Disconnect the connectors from the R/L motor ASSY (15201-2510), pulse motor (15201-E007), and TRC sensors (15201-BA11 [n = 2]) (see 9.3 [p276]).
  - 6 ) Remove the clamps from the disconnected cables.



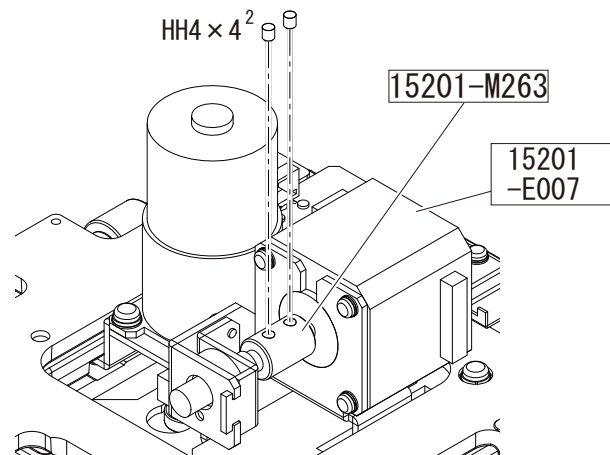
- 6 . Unscrew BS4 × 8 (n = 4) from the capturing ASSY (15201-3000).
- 7 . Remove the capturing ASSY (15201-3000).



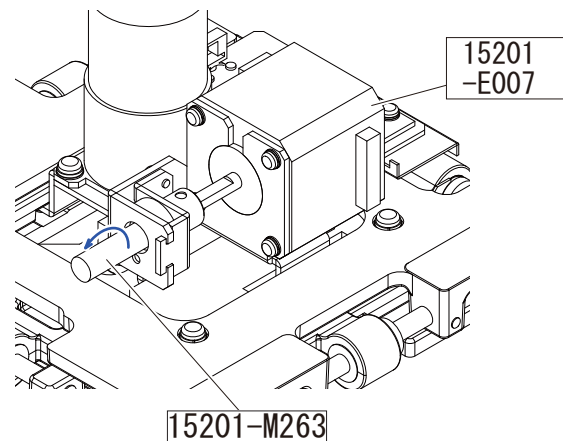
- 8 . Unscrew BS4 × 6 (n = 6) from the horizontal tracking ASSY (15201-2500).
- 9 . Remove the horizontal tracking ASSY (15201-2500).



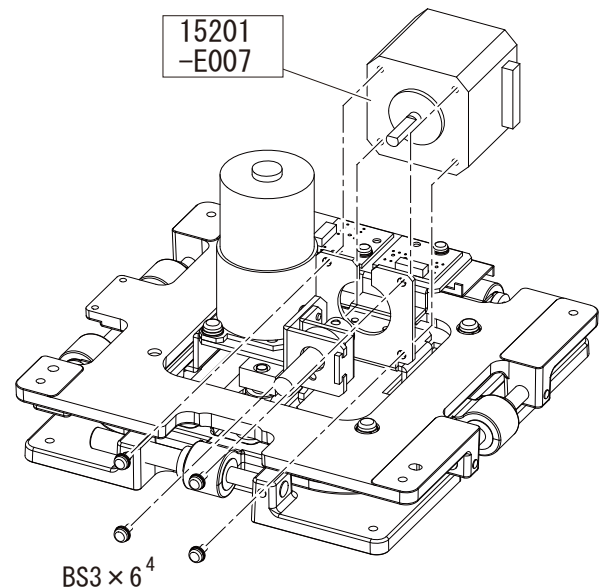
10. Loosen HH4 × 6 (n = 2) fastening the F/B feed screw (15201-M263).



11. Turn the F/B feed screw (15201-M263) counterclockwise to remove it from the shaft of the pulse motor (15201-E007).




12. Unscrew BS3 × 6 (n = 4) from the pulse motor (15201-E007).  
13. Replace the pulse motor (15201-E007).



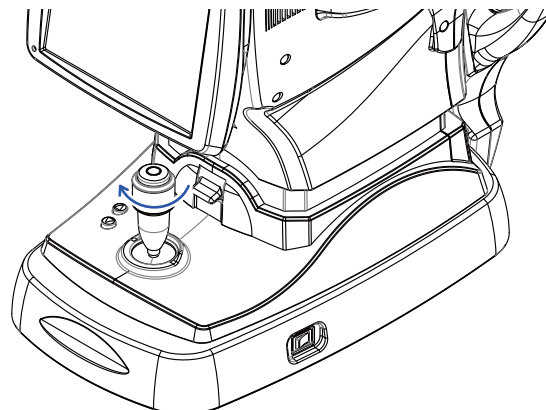
14. Reassemble the parts in the reverse order.  
15. Perform the procedure as in “8.3.8 Tracking check” (p162).  
16. Perform the procedure as in “8.4.1 Tracking adjustment (p211)”.

## 7.3.5 Brushless geared motor (15601-E008)

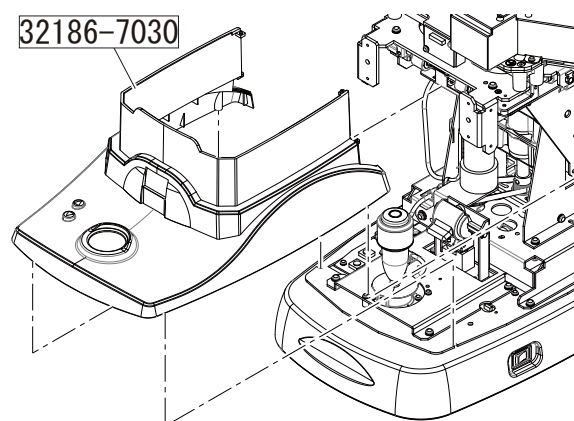
### Replacement part: 15201-E008

 **Caution** Be sure to check the tension of the belt before removing the motor.

- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.

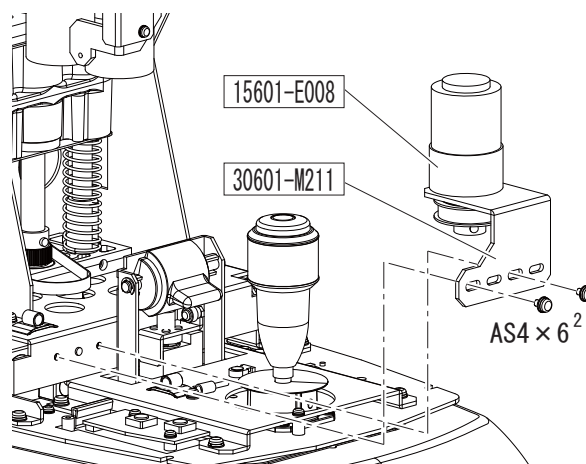


- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).

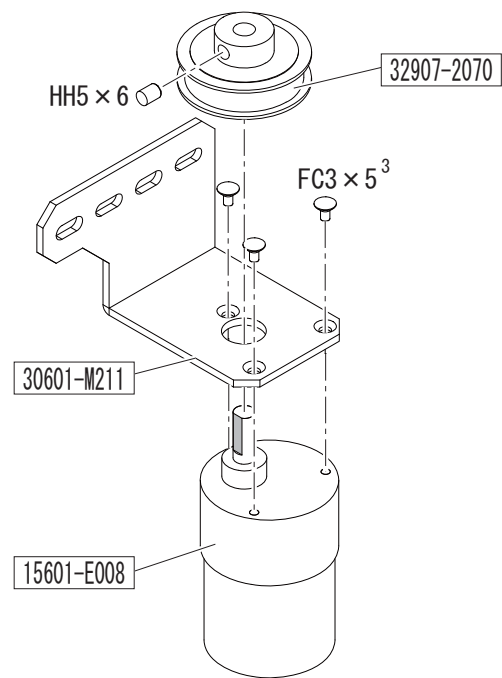


- 5 . Disconnect all connectors from the brushless geared motor (15601-E008) (see 9.3 [p276] and 9.4 [p277]).

- 6 . Unscrew AS4 × 6 (n = 2) from the U/D M bracket (30601-M211) to the body bracket (32186-M203) to remove the brushless geared motor (15601-E008) along with the U/D M bracket (30601-M211).



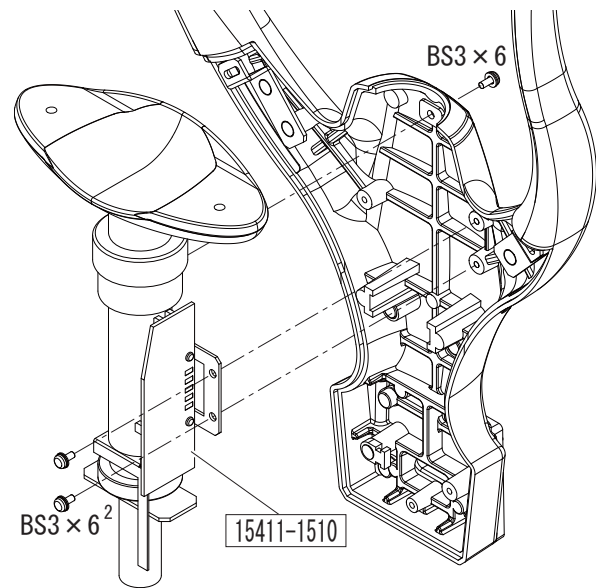
- 7 . Loosen HH5 × 6 fastening the pulley (32907-2070) to the shaft of the brushless geared motor (15601-E008).
- 8 . Remove the pulley (32907-2070).
- 9 . Unscrew FC3 × 6 (n = 3) from the U/D M bracket (30601-M211).
10. Replace the brushless geared motor (15601-E008).
11. Reassemble the parts in the reverse order.
12. Adjust the tension of the belt (32156-M098) so that it becomes almost the same as before.
13. Check the assembly operation.



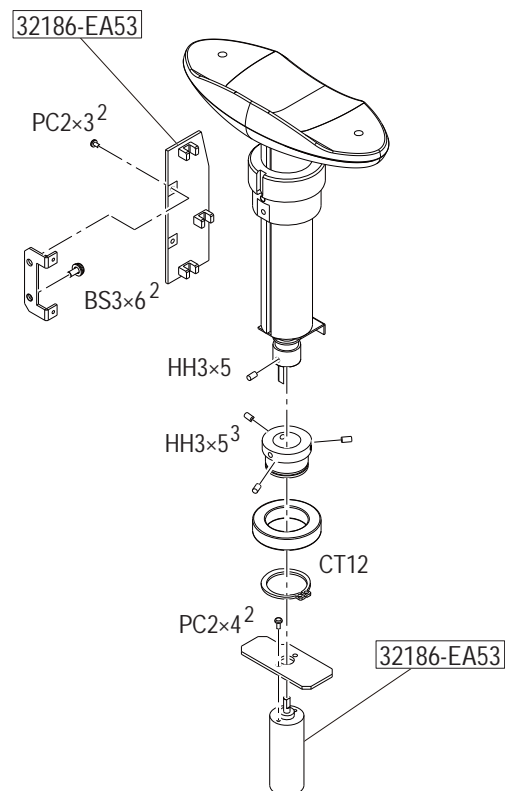
### 7.3.6 Chinrest (32186-EA53)

#### Replacement part: 32186-EA53

- 1 . Remove the chinrest ASSY (see 7.1.8 [p88]).
- 2 . Unscrew BS3 × 6 (n = 2) from the chinrest (32186-EA53).



- 3 . Remove the motor from the shaft.
- 4 . Remove the sensor board from the bracket.
- 5 . Replace the chinrest (32186-EA53).

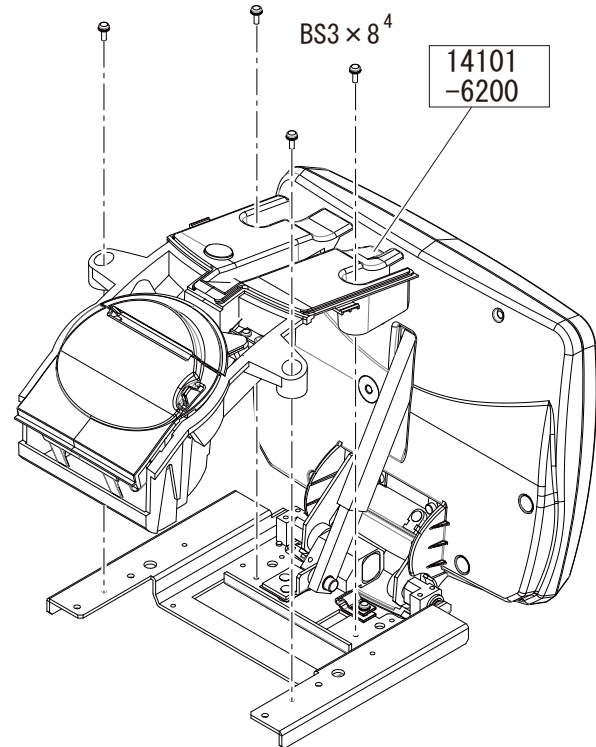


- 6 . Reassemble the parts in the reverse order.
- 7 . Check the assembly operation.

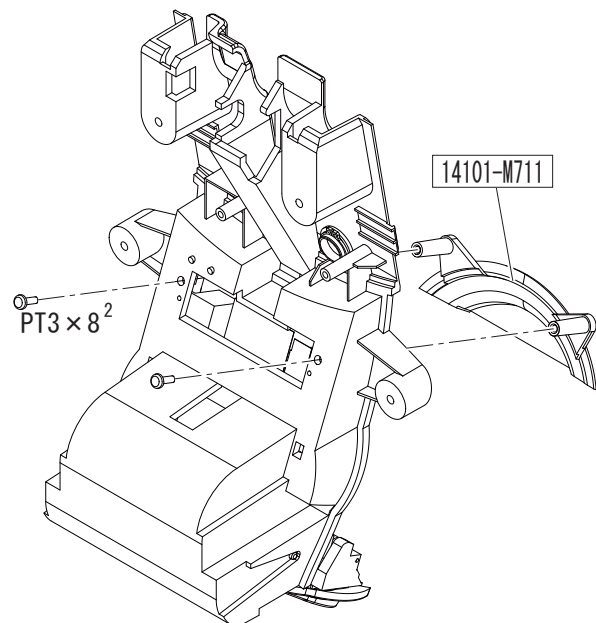
### 7.3.7 Printer (80606-00018)

#### Replacement part: 80606-00018

- 1 . Remove the printer ASSY (14101-6200)  
(see 6.3 [p56]).

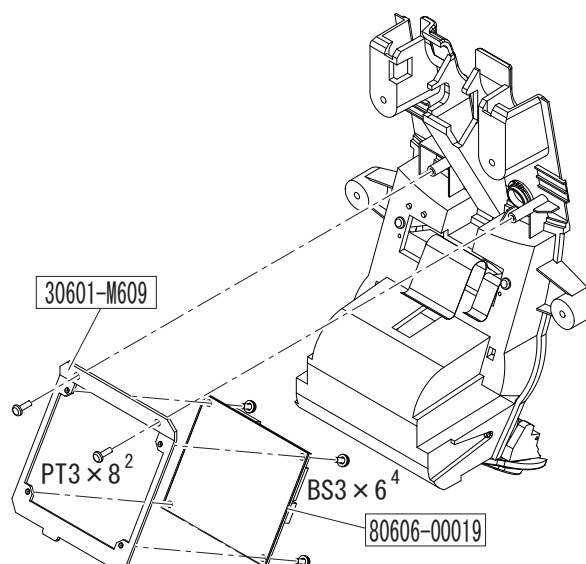


- 2 . Unscrew PT3 x 8 (n = 2) to remove the printer cover (14101-M711).

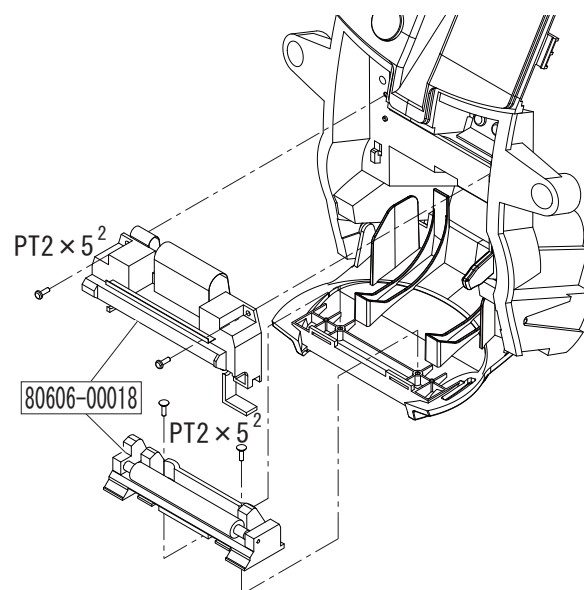




- 3 . Disconnect P (CN3) and P (CN4) from the printer interface board (80606-00019).
- 4 . Remove the printer interface board (80606-00019) along with the PR board attachment plate (30601-M609) (see 7.3.8 [p116]).



- 5 . Unscrew PT2 x 5 (n = 4) from the printer (80606-00018).
- 6 . Replace the printer (80606-00018).

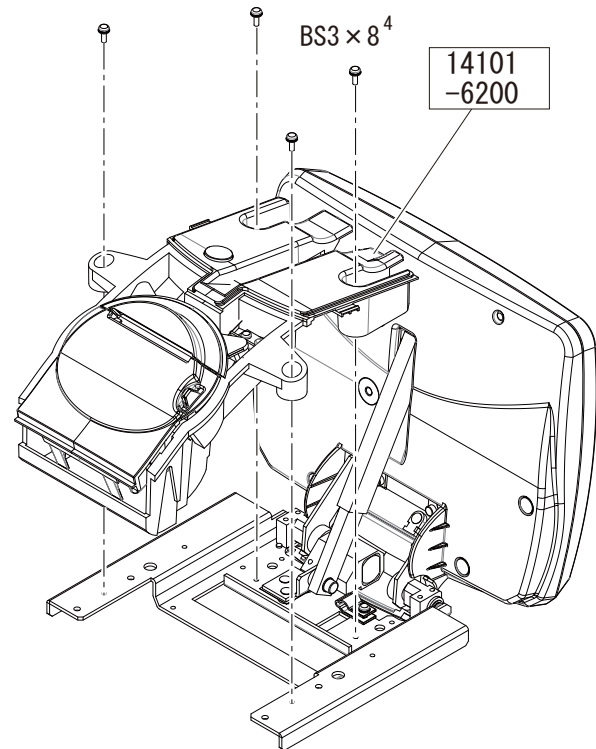


- 7 . Reassemble the parts in the reverse order.
- 8 . Perform the procedure as in "8.3.5 Print check" (p158).

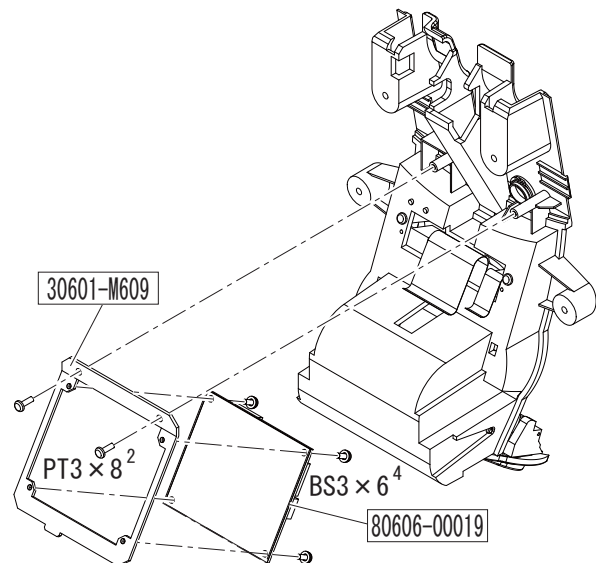
### 7.3.8 Printer interface board (80606-00019)

#### Replacement part: 80606-00019

- 1 . Remove the printer ASSY (14101-6200)  
(see 6.3 [p56]).



- 2 . Unscrew PT3 x 8 (n = 2) from the PR board attachment plate (30601-M609).
- 3 . Remove the printer interface board (80606-00019) along with the PR board attachment plate (30601-M609).
- 4 . Disconnect all connectors from the printer interface board (80606-00019).
- 5 . Unscrew BS3 x 6 (n = 4) from the printer interface board (80606-00019).
- 6 . Replace the printer interface board (80606-00019).

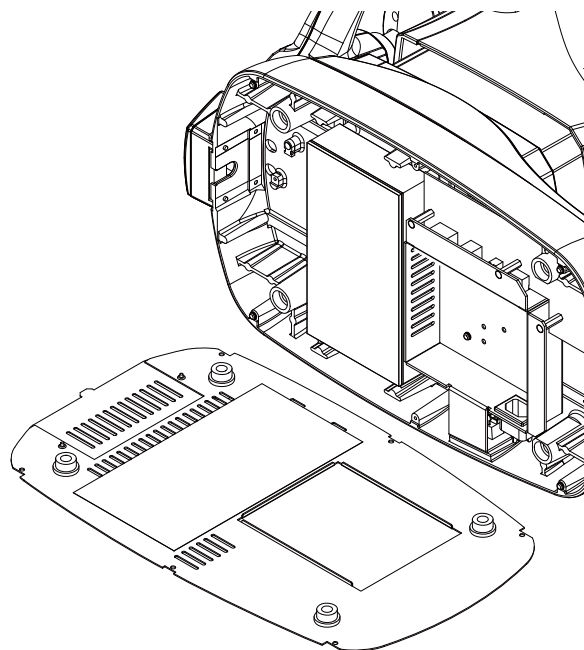


- 7 . Reassemble the parts in the reverse order.
- 8 . Perform the procedure as in "8.3.5 Print check" (p158).

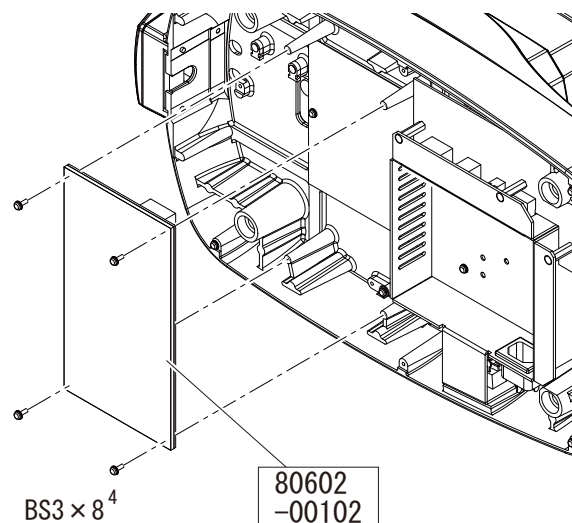
### 7.3.9 Switching regulator (80602-00102)

#### Replacement part: 80602-00102

- 1 . Remove the bottom plate (30601-M002) (see 6.6 [p60]).



- 2 . Unscrew BS3 × 8 (n = 4) from the switching regulator (80602-00102).
- 3 . Disconnect P001 and P051 from the switching regulator (80602-00102).
- 4 . Replace the switching regulator (80602-00102).



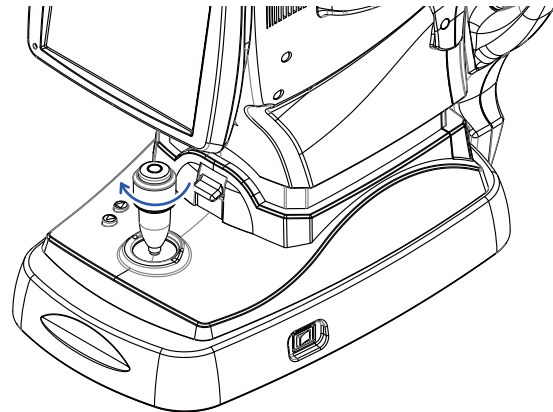
- 5 . Reassemble the parts in the reverse order.
- 6 . Check the assembly operation.

## 7.4 Mechanical Components

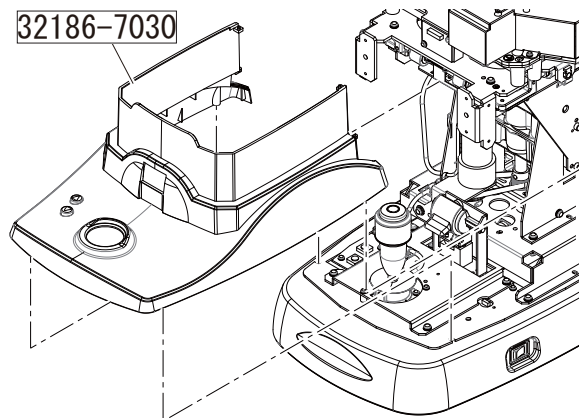
### 7.4.1 R/L shaft (30601-M201)

#### Replacement part: 30601-M201

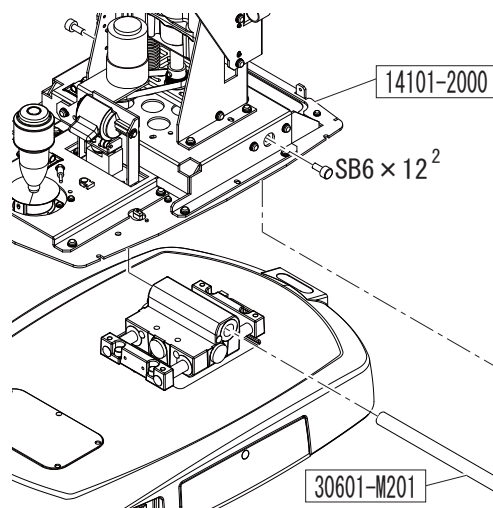
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).
- 5 . Disconnect P102 (J2) from the main board (15201-BA01).
- 6 . Disconnect P202 (J2) from the driver board (15201-BA02).
- 7 . Release the clamp from the cables.
- 8 . Disconnect the GND terminal from the base cable (15201-CA52).



- 9 . Unscrew SB6 × 12 (n = 2) to remove the capturing ASSY (15201-3000) along with the body ASSY (15201-2000).
- 10 . Replace the R/L shaft (30601-M201).

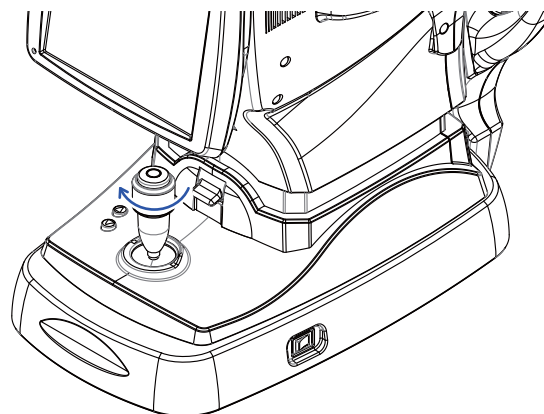


- 11 . Reassemble the parts in the reverse order.
- 12 . Check the assembly operation.

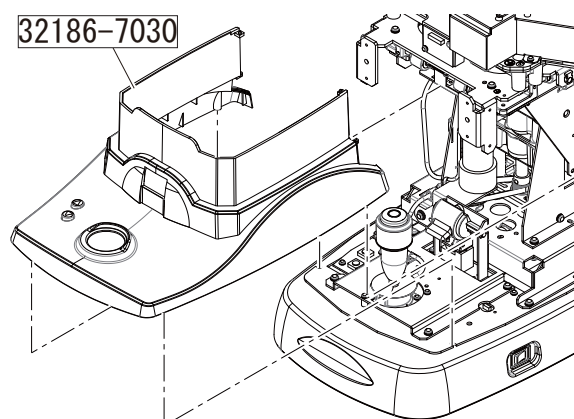
## 7.4.2 F/B shaft (30601-M103)

### Replacement part: 30601-M103

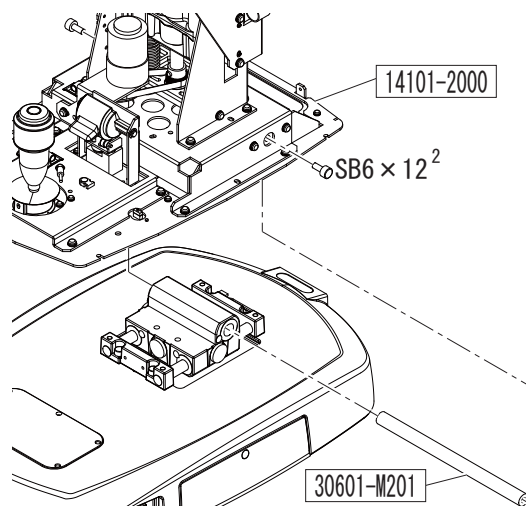
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).

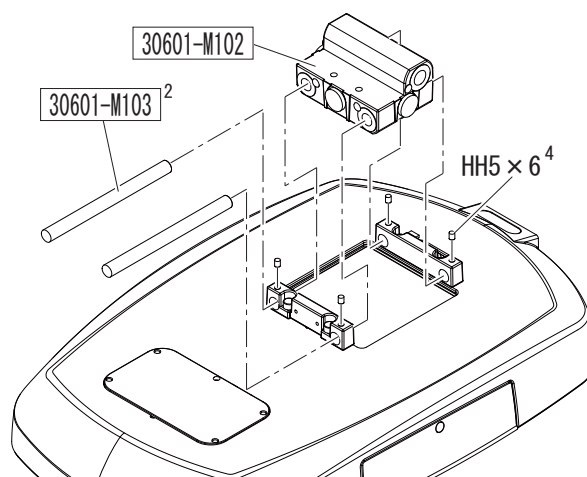


- 5 . Remove the R/L shaft (30601-M201) (see 7.4.1 [p118]).



- 6 . Unscrew HH5 x 6 (n = 4) from the F/B shaft (30601-M103).
- 7 . Replace the F/B shaft (30601-M103).

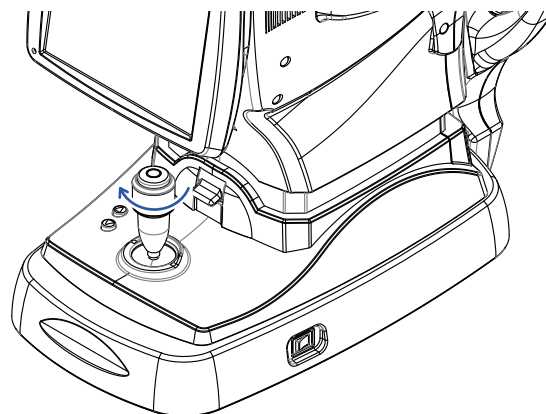
- 8 . Reassemble the parts in the reverse order.
- 9 . Check the assembly operation.



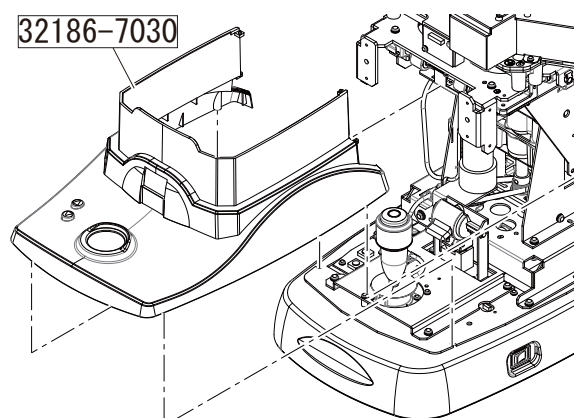
### 7.4.3 Linear bush (82001-LM028)

#### Replacement part: 82001-LM028

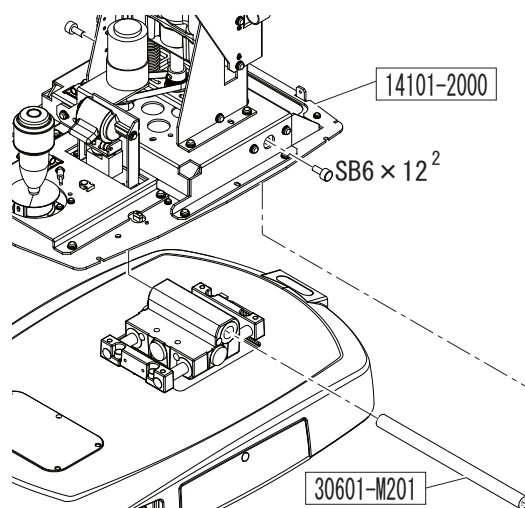
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



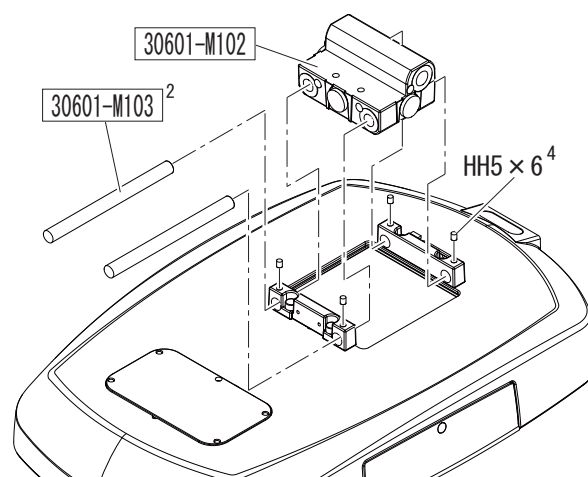
- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



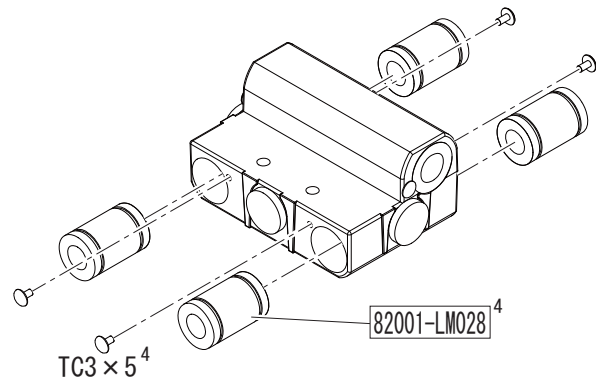
- 5 . Remove the R/L shaft (30601-M201) (see 7.4.1 [p118]).




- 6 . Remove the F/B shaft (30601-M103) (see 7.4.2 [p119]).



- 7 . Unscrew TC3 × 5 (n = 4) from the linear bushes (82001-LM028 [n = 4]).
- 8 . Replace the linear bushes (82001-LM028 [n = 4]).



- 9 . Reassemble the parts in the reverse order.

 Caution	Do not touch the linear bush (82001-LM028) with bare hands. Be sure to wear finger cots or such. Wipe off the anti-rust oil on the surface with dry cloth.
-------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------

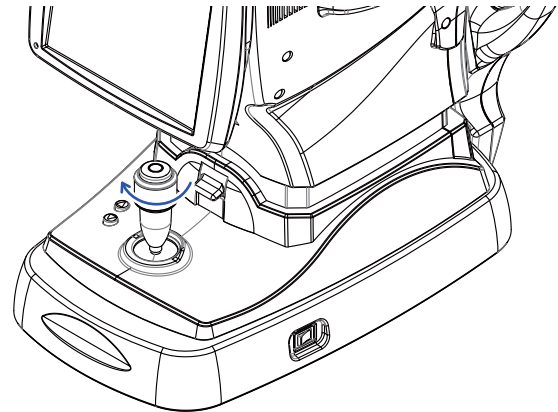
- 10 . Check the assembly operation.



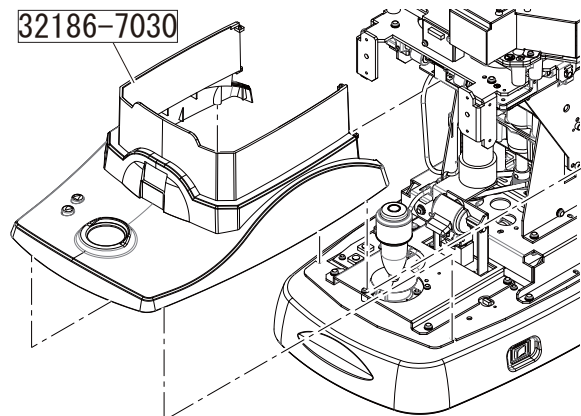
## 7.4.4 Linear bush (82001-LM097)

### Replacement part: 82001-LM097

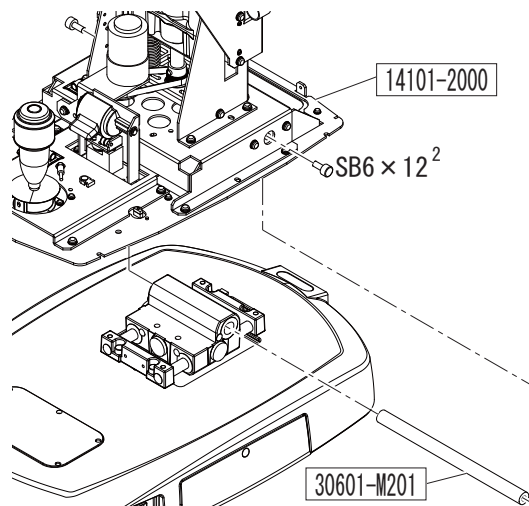
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



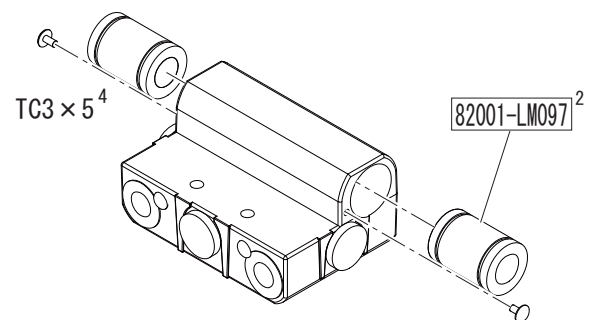
- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 5 . Remove the R/L shaft (30601-M201) (see 7.4.1 [p118]).



- 6 . Unscrew TC3 x 5 (n = 2) from the linear bushes (82001-LM097 [n = 2]).
- 7 . Replace the linear bushes (82001-LM097 [n = 2]).



---

8 . Reassemble the parts in the reverse order.



Caution

Do not touch the linear bush (82001-LM097) with bare hands. Be sure to wear finger cots or such.

Wipe off the anti-rust oil on the surface with dry cloth.

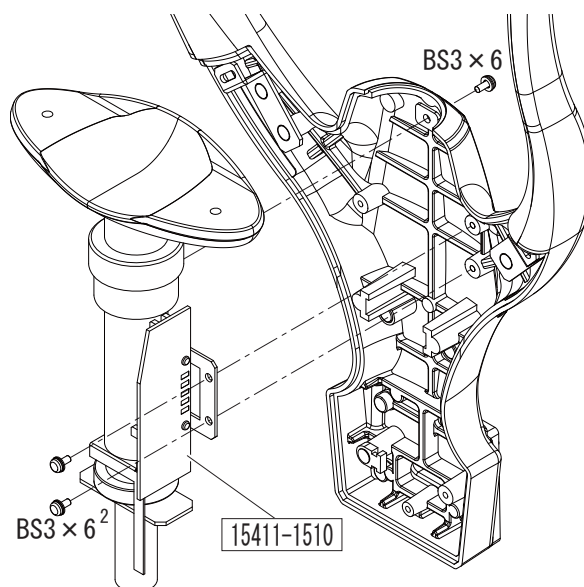
Assemble the bearings so that the main unit moves to the right, left, forward, and backward smoothly.

9 . Check the assembly operation.

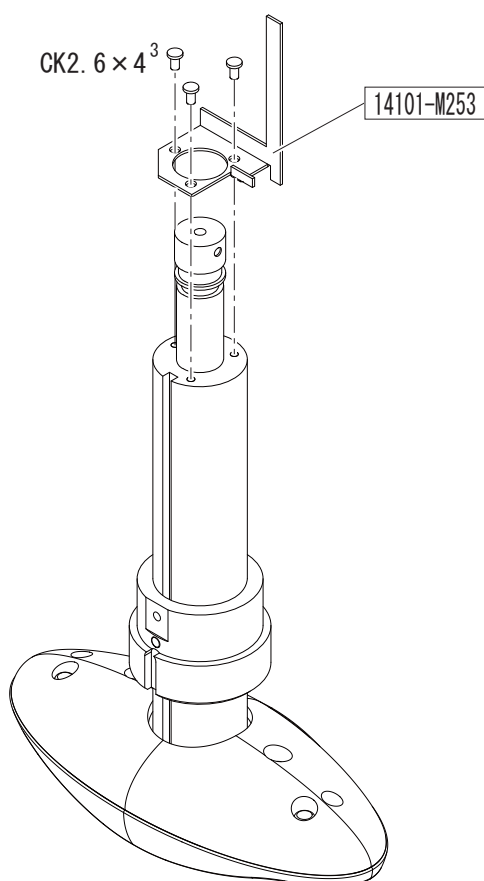
## 7.4.5 Shading plate (32186-M051)

### Replacement part: 32186-M051

- 1 . Remove the chinrest ASSY (15411-1510) (see 7.1.8 [p88]).
- 2 . Remove the chinrest (32186-EA53) (see 7.3.6 [p113]).



- 3 . Unscrew CK2.6 x 4 (n = 3) to replace the shading plate (32186-M051).

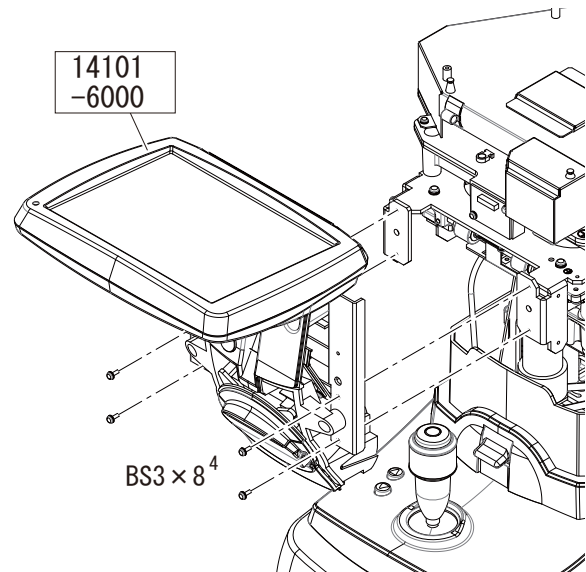


- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.

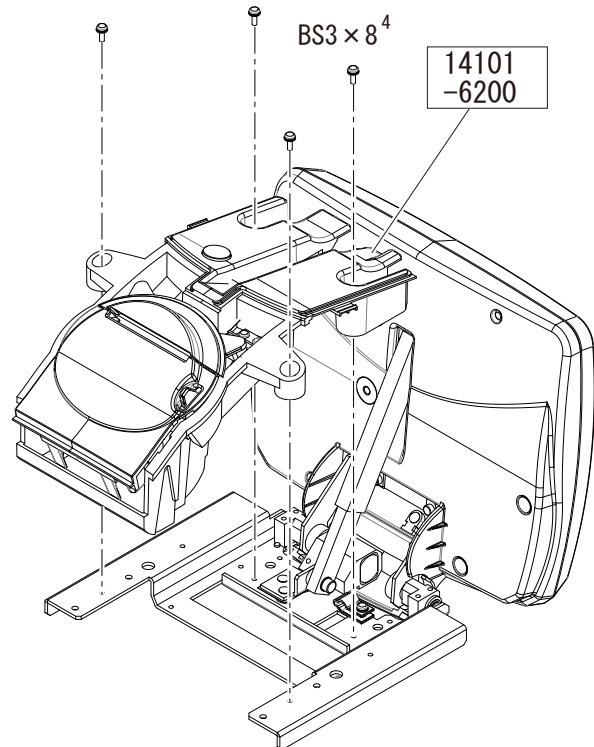
## 7.4.6 Multistage stay (14101-M639)

### Replacement part: 14101-M639

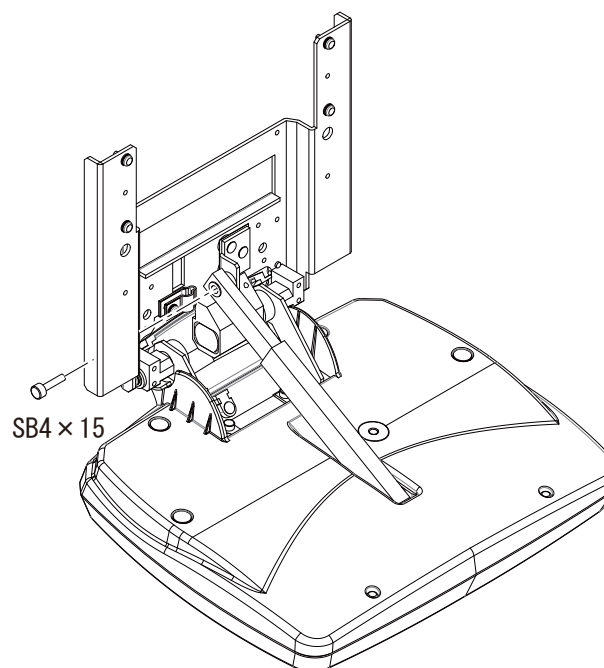
- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



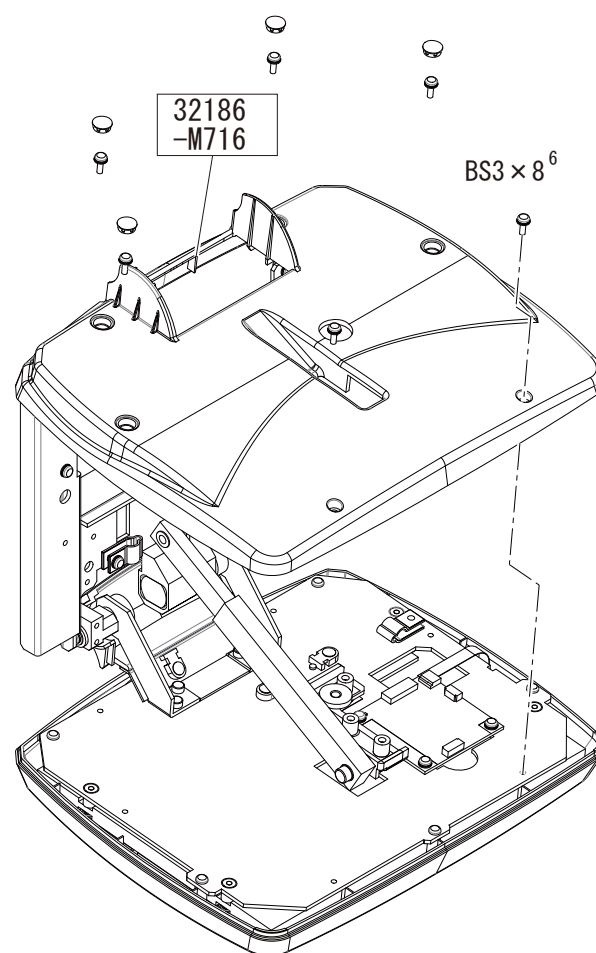
- 2 . Remove the printer ASSY (14101-6200) (see 6.3 [p56]).



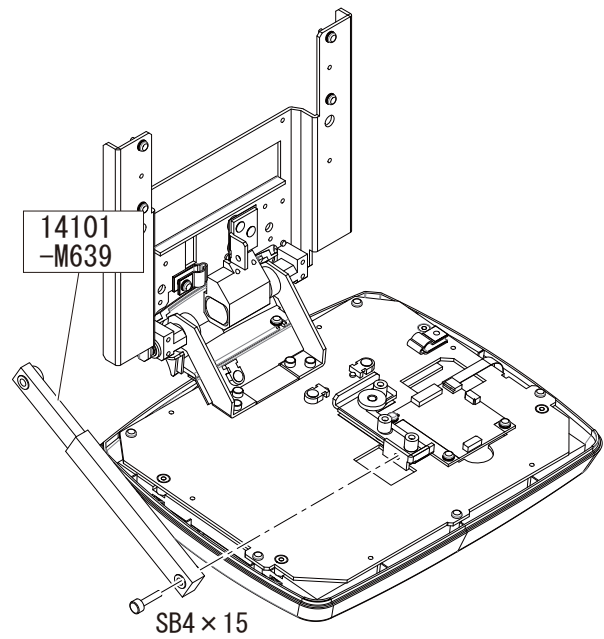
3 . Unscrew SB4 × 15.



4 . Remove the LCD rear cover (32186-M716).



- 5 . Unscrew SB4 × 15 from the multistage stay (14101-M639).
- 6 . Replace the multistage stay (14101-M639).

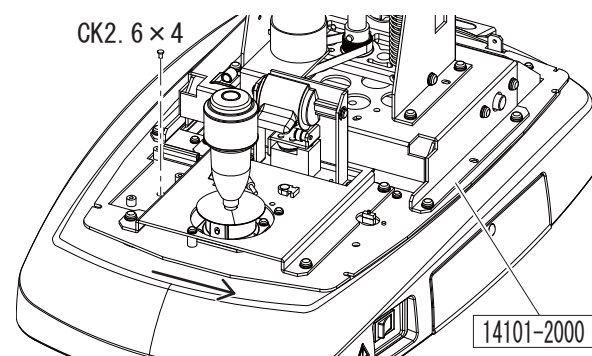
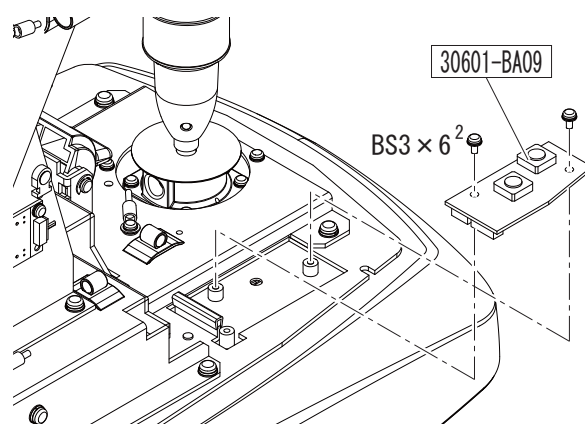
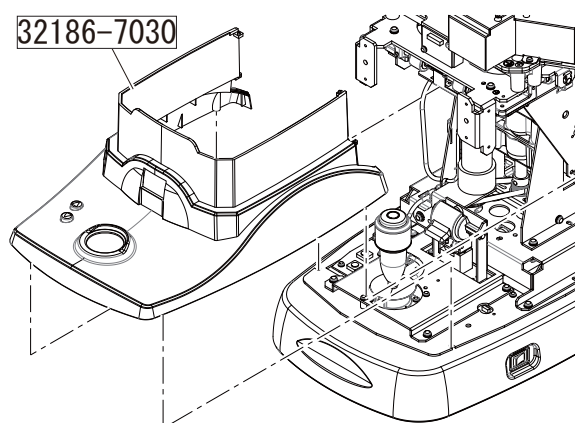


- 7 . Reassemble the parts in the reverse order.

## 7.4.7 Sliding plate (32105-M102)

### Replacement part: 32105-M102

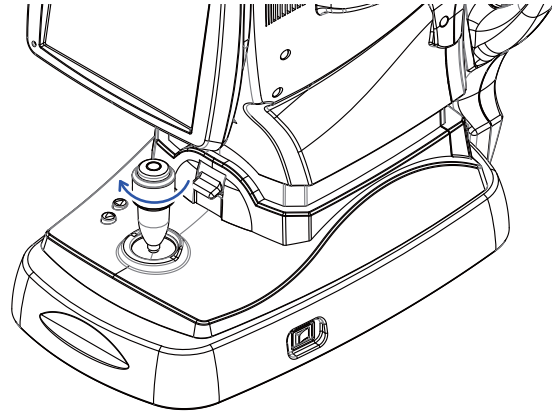
- 1 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).
- 2 . Remove the U/D SW board(30601-BA09) (see 7.2.12 [p103]).
- 3 . Align the holes on the base slide (32186-M202) with the screw positions.
- 4 . Unscrew CK2.6 × 4 (n = 4) from the sliding plate (32105-M102).
- 5 . Replace the sliding plate (32105-M102).
- 6 . Reassemble the parts in the reverse order.
- 7 . Check the assembly operation.



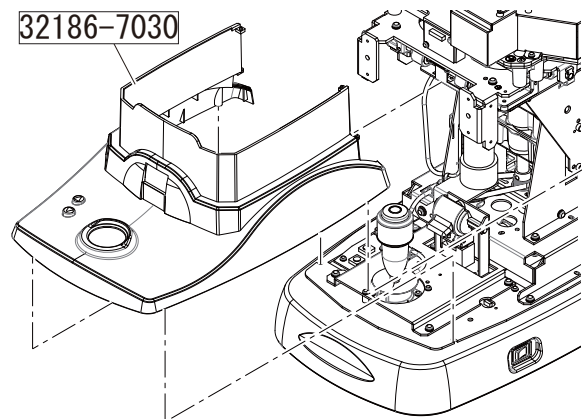
## 7.4.8 U/D sensor plate (15201-M213)

### Replacement part: 15201-M213

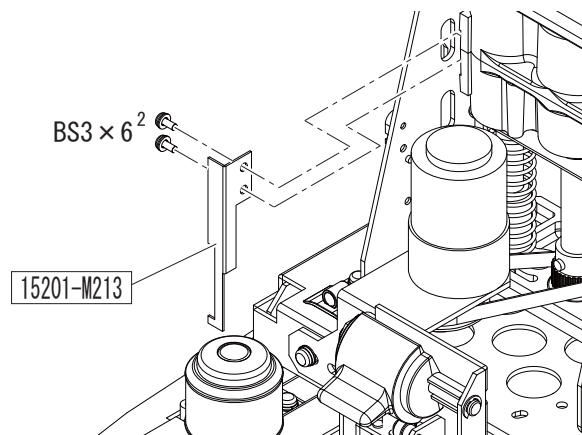
- 1 . Turn on the device.
- 2 . Raise the capturing unit to the top with the joystick.
- 3 . Turn off the device.



- 4 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 5 . Unscrew BS3 × 6 (n = 2) from the U/D sensor plate (15201-M213).
- 6 . Replace the U/D sensor plate (15201-M213).



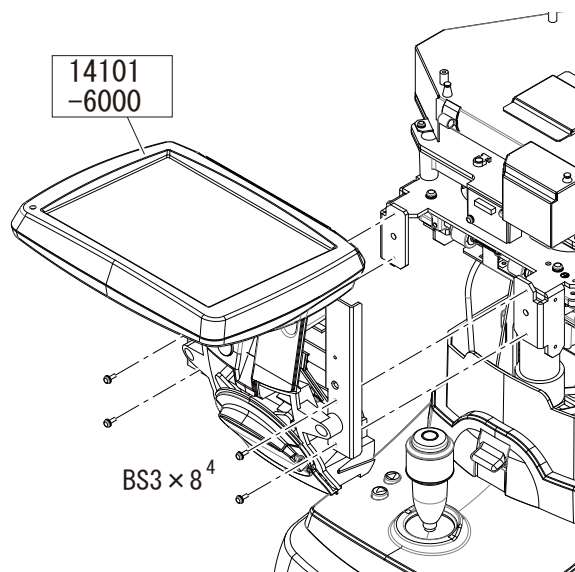
- 7 . Reassemble the parts in the reverse order.
- 8 . Check the assembly operation.



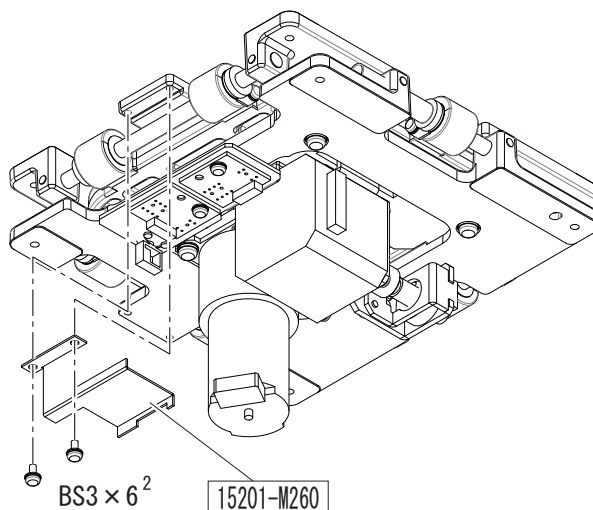
## 7.4.9 R/L sensor plate (15201-M260)

### Replacement part: 15201-M260

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 2 . Unscrew BS3 × 6 (n = 2) from the R/L sensor plate (15201-M260).
- 3 . Replace the R/L sensor plate (15201-M260).

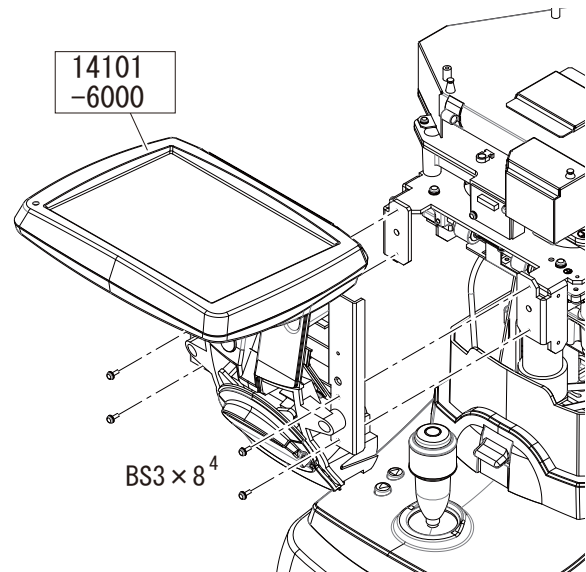


- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.

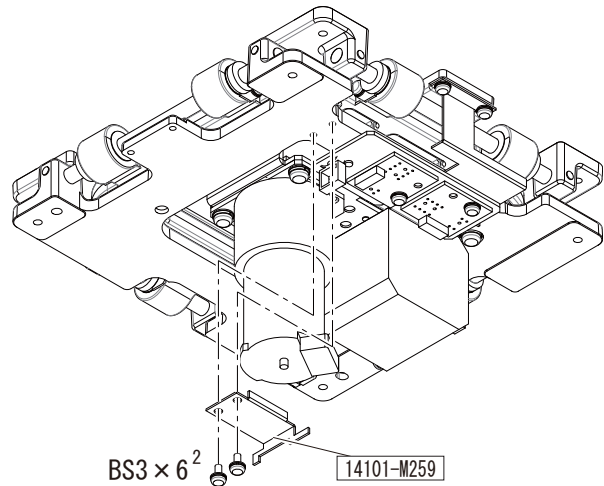
## 7.4.10 F/B sensor plate (15201-M259)

### Replacement part: 15201-M259

- 1 . Remove the capturing unit rear cover ASSY (14101-6000) (see 6.2 [p55]).



- 2 . Unscrew BS3 × 6 (n = 2) from the F/B sensor plate (15201-M259).
- 3 . Replace the F/B sensor plate (15201-M259).



- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.

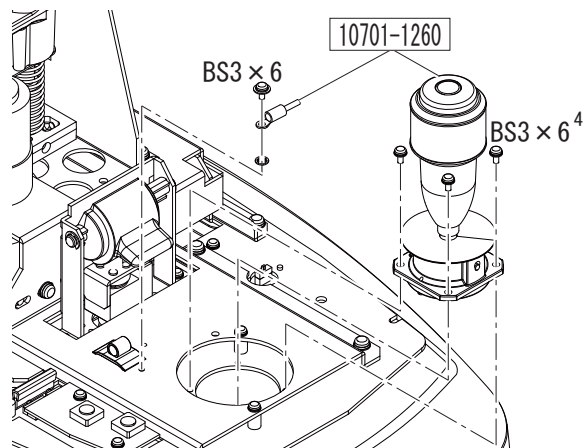
## 7.5 Consumables

### 7.5.1 Joystick

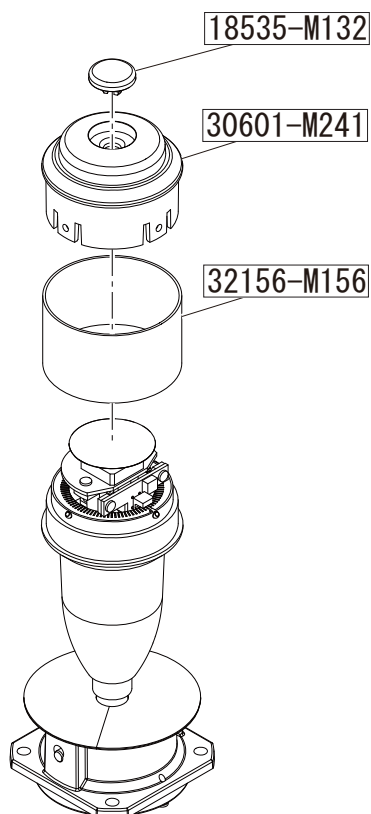
#### 7.5.1.1 Start button (18535-M132)

**Replacement part: 82001-ML028**

- 1 . Remove the joystick ASSY (10701-1260)  
(see 7.1.6 [p87]).



- 2 . Remove the rubber ring (32156-M156)  
(see 7.5.1.2 [p134]).
- 3 . Pull out the knob (30601-M241), and the  
start button (18535-M132) comes free.



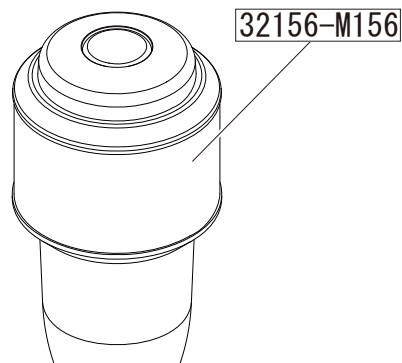
- 4 . Reassemble the parts in the reverse order.
- 5 . Check the assembly operation.

---

### 7.5.1.2 Rubber ring (32156-M156)

#### Replacement part: 32156-M156

- 1 . Roll up the rubber ring (32156-M156) to remove it from the joystick.
- 2 . Reassemble the parts in the reverse order.
- 3 . Check the assembly operation.

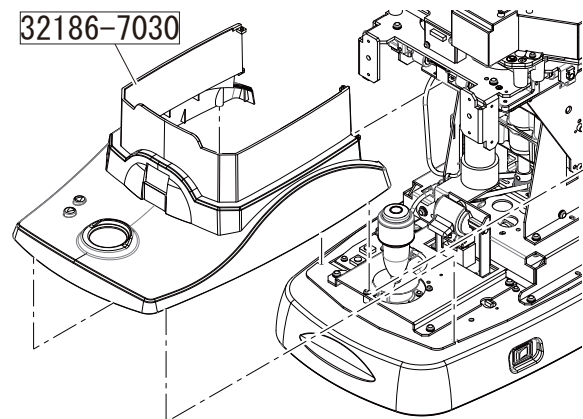


## 7.5.2 Brake

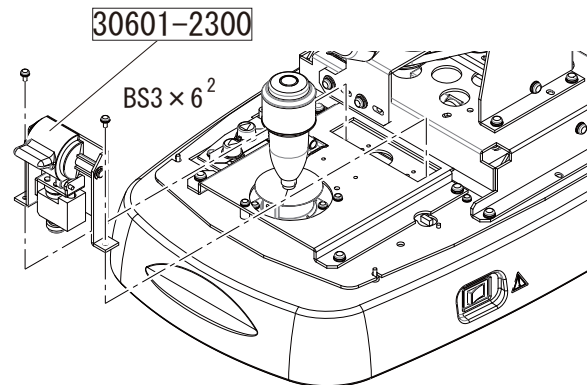
### 7.5.2.1 Rubber foot (820-47-1203A)

Replacement part: 820-47-1203A

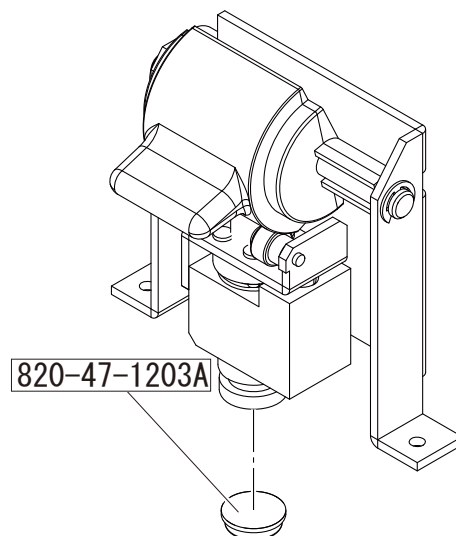
- 1 . Remove the body cover ASSY (32186-7030) (see 6.5 [p58]).



- 2 . Remove the brake ASSY (30601-2300) (see 7.1.9 [p89]).



- 3 . Peel off the worn-out rubber foot (82047-1203A).
- 4 . Clean the area where the rubber foot was attached.
- 5 . Attach a new rubber foot (82047-1203A).



- 6 . Reassemble the parts in the reverse order.
- 7 . Check the assembly operation.

This page is intentionally left blank.

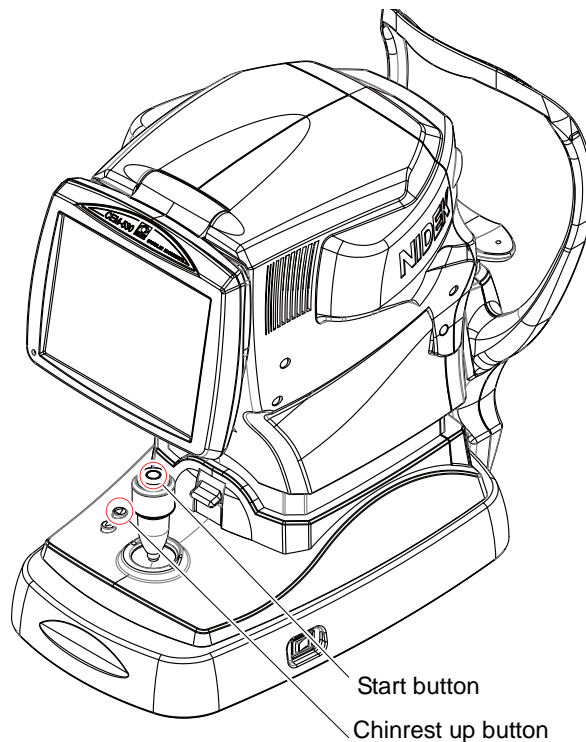
## 8 CHECK/ADJUSTMENT/UPGRADE

### 8.1 Activating Maker Mode

<p>⚠ Caution</p>	<p>This mode is for device adjustments. Do not use any prohibited functions or functions not specifically mentioned in this manual.</p>
------------------	---------------------------------------------------------------------------------------------------------------------------------------------

- 1 . Turn on the device while pressing the start button and chinrest up button.

<p>⚠ Caution</p>	<p>Press and hold the buttons until the screen displays something.  If the start button or chinrest up button is defective, Maker mode cannot be activated .</p>
<p>📌 Note</p>	<p>When Beep is set to “On” and a beep sounds during device initialization, the buttons may be released.</p>



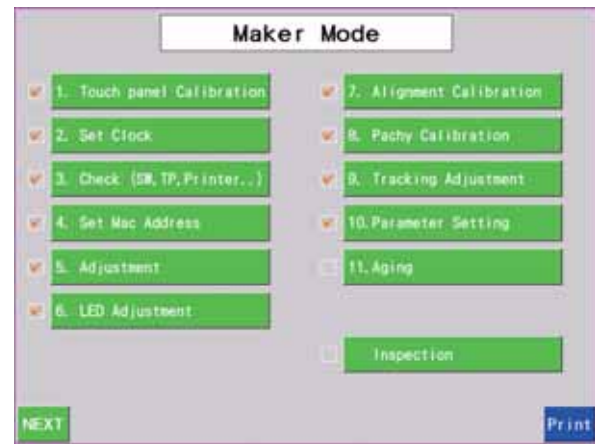
A keyboard is displayed on the screen.

- 2 . Enter “x3sm1”.

- 3 . Press the  button.

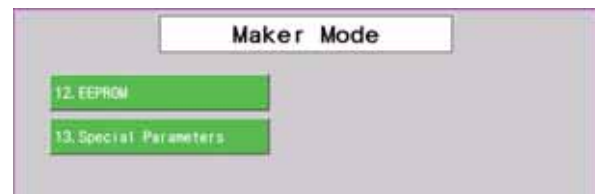


The Maker Mode screen is displayed.



4 . Press the **Next** button.

The following menu is displayed.



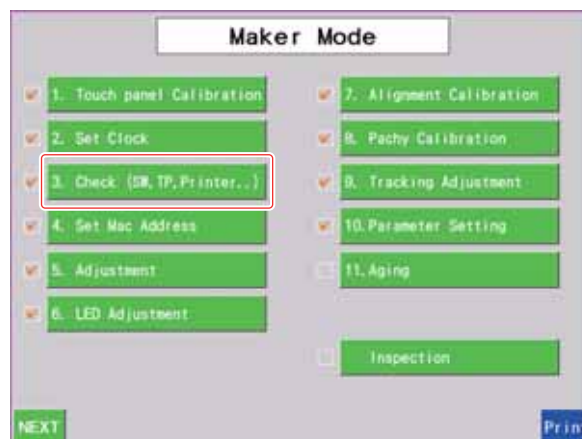
Menu	Description	Intended use
1. Touch panel Calibration	Calibrates the touch panel position. Equivalent to "Touch Panel" on the Maintenance screen	8.4.4 Touch panel calibration (p236)
2. Set Clock	Sets the date and time. Equivalent to "Date, Time" on the Maintenance screen	8.6.5 Date and time setting (p260)
3. Check (SW,TP,Printer..)	Checks the functions (see 8.1.1 [p139]).	Used to identify the trouble location when the device does not operate properly.
4. Set Mac Address	Sets the MAC address.	Not permitted
5. Adjustment	Prohibited basically (see 8.1.2 [p141]) If endothelial cell density measurement values are outside the normal range, perform readjustment using "7. Endo Image Calibration".	
6. LED Adjustment	If endothelial cell density measurement values are outside the normal range, readjustment is required continuously after "7. Endo Image Calibration".	
7. Alignment Calibration		
8. Pachy Calibration	Calibrates pachymetry.	Performed when pachymetry values are outside the normal range.
9. Tracking Adjustment	Adjusts the auto tracking function.	8.4.1 Tracking adjustment (p211)
10. Parameter Setting	Sets the destinations.	Not permitted
11. Aging	Endurance test mode	Not permitted
Inspection	Checks the performances (see 8.1.3 [p142]).	Confirms each performance meets the specifications.
Print	Prints out factory settings and parameter settings.	Not permitted
12. EEPROM	Restores the EEPROM data.	8.5.3 Adjustment data recovery (p242)
13. Special Parameters	Special parameters	Not permitted



### 8.1.1 3. Check (SW, TP, Printer..) screen

1 . Activate Maker mode (see 8.1 [p137]).

2 . Press the 3. Check (SW,TP,Printer..) button.



3 . The 3. Check screen is displayed.



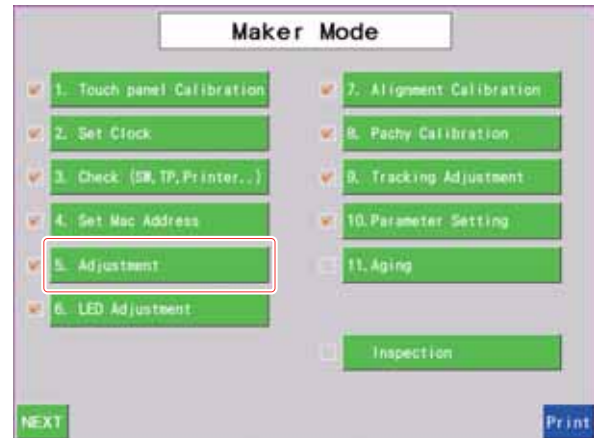
Menu	Description	Intended use
Switch Check	Checks the switch or button operation	7.1.6 Joystick ASSY (10701-1260) (p87) 7.3.6 Chinrest (32186-EA53) (p113) 7.2.12 U/D SW board (30601-BA09) (p103) 8.3.11 Joystick check (p175)
Touch Panel Check	Checks the touch panel operation.	7.1.4 LCD ASSY (14101-6100) (p83) 7.1.5 Pad-attached LCD ASSY (14101-6110) (p85) 8.4.4 Touch panel calibration (p236)
Print Check	Checks the print function.	7.3.8 Printer interface board (80606-00019) (p116) 7.3.7 Printer (80606-00018) (p114)
Video Print Check	Checks the print when the video printer is connected.	—
Chinrest Check	Checks the chinrest operation.	7.1.6 Joystick ASSY (10701-1260) (p87) 7.3.6 Chinrest (32186-EA53) (p113) 8.3.11 Joystick check (p175)

---

Tracking Check	Checks the tracking function of the capturing unit.	7.1.2 Adjusted SM capturing ASSY (15201-9100) (p77) 7.1.3 R/L motor ASSY (15201-2510) (p80) 7.2.2 Driver board (15201-BA02) (p92) 8.3.2 Tracking check (p151)
Camera Check	Checks the camera display and gain.	8.3.9 Camera check (p171)
Fixation Check	Checks the fixation lamp function.	8.3.10 Fixation check (p172)

## 8.1.2 5. Adjustment screen

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the **5. Adjustment** button.



- 3 . The 5. Adjustment screen is displayed.



Menu	Description	Intended use
1. Endo LED	Adjusts the optic axis of illumination for endothelial image capture.	Not permitted
2. Line LED	Adjusts the optic axis of illumination for distance detection.	Not permitted
3. Observation	Adjusts the illumination for anterior segment observation.	Not permitted
4. Endothel ilum1 (1-5)	Adjusts the endothelium illumination.	Not permitted
4. Endothel ilum1 (6-12)		Not permitted
5. Line CCD	Adjusts the Line CCD.	Not permitted
6. LED Calibration	Calibrates FLASH and LINE LED.	Not permitted
7. Endo Image Calibration	Calibrates endothelial cell density measurement	8.4.2 Endo image calibration (p214)

### 8.1.3 Inspection screen

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the **Inspection** button.



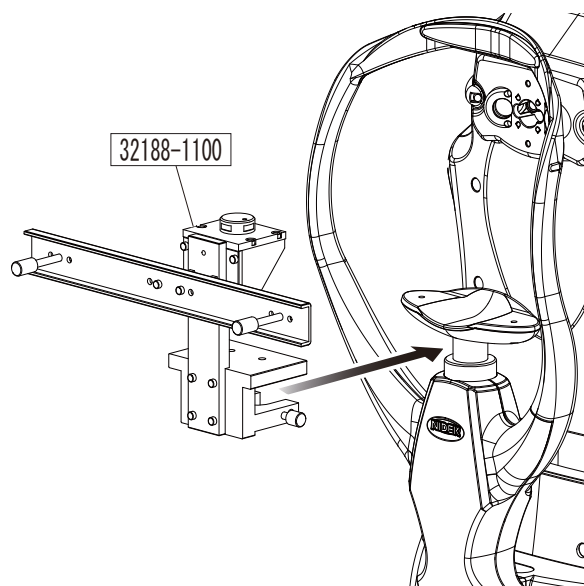
- 3 . The Inspection screen is displayed.

Menu	Description	Intended purpose
1. Check Capture Area	Checks the capture area. • Slit size check • Chart size check	Preparation for endothelium measurement accuracy check High-accuracy measurement
2. Check Resolution	Checks the central resolution.	
3. Check Periphery	Checks the peripheral resolution.	
4. Check Cell Density	Checks endothelium measurement accuracy.	8.3.12 Endothelium measurement accuracy check (p176)
5. Check Pachy	Checks pachymetry accuracy.	8.3.13 Pachymetry accuracy check (p203)
6. Sleep Check	Checks the sleep mode function.	Not permitted
Print cut	Checks the printer cutter.	8.3.5 Print check (p158)

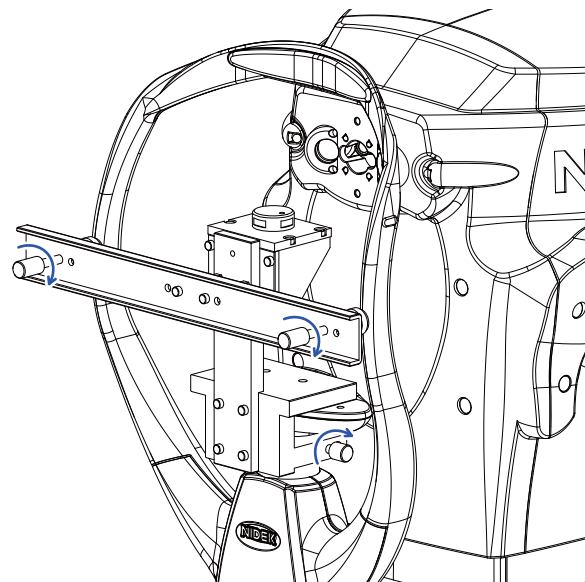
## 8.2 Attaching the Jigs

### 8.2.1 Chinrest attachment jig (32188-1100)

- 1 . Move the chinrest to the lowest position.
- 2 . Attach the chinrest attachment jig (32188-1100).

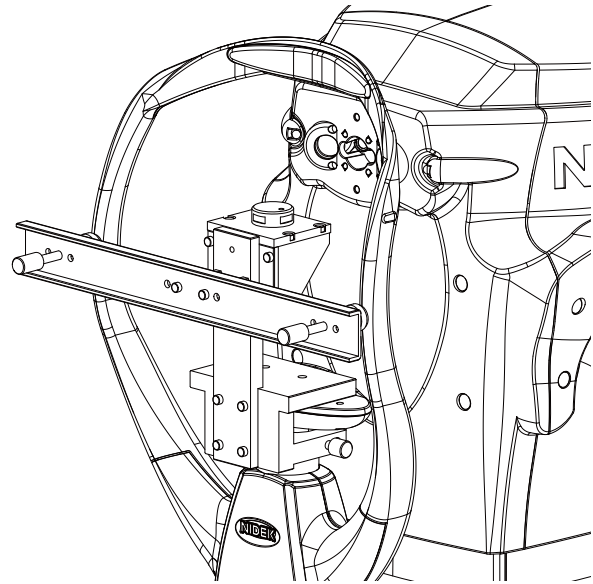


- 3 . Tighten the knurled screws to fasten the jig to the chinrest.

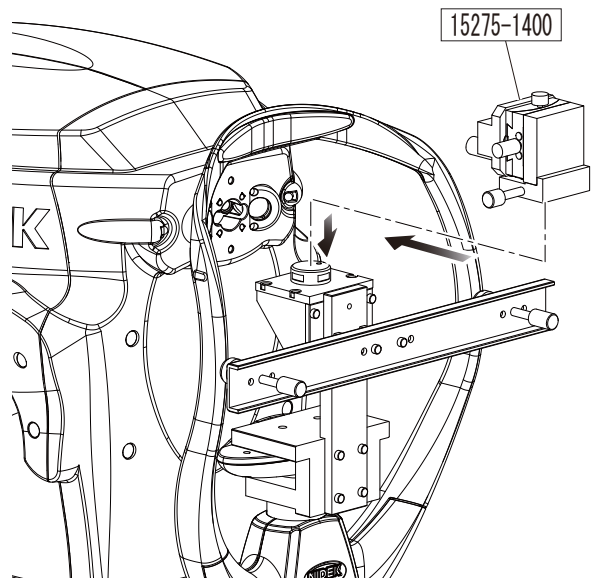


## 8.2.2 Calibration jig (15275-1400)

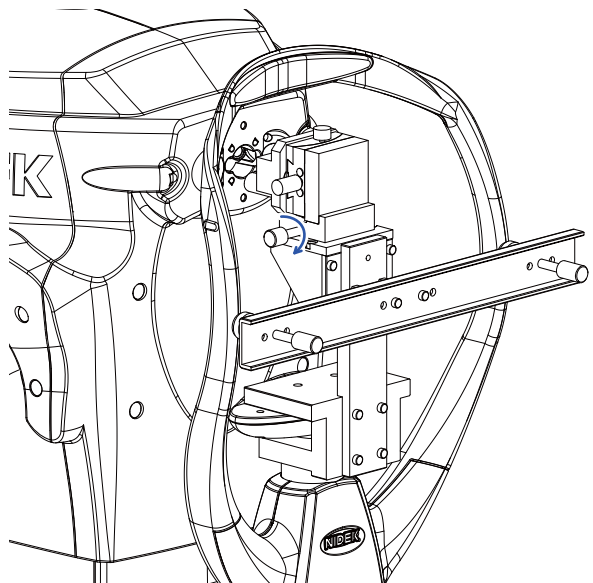
- 1 . Attach the chinrest attachment jig (32188-1100) (see 8.2.1 [p143]).



- 2 . Attach the calibration jig (15275-1400) to the chinrest attachment jig (32188-1100).

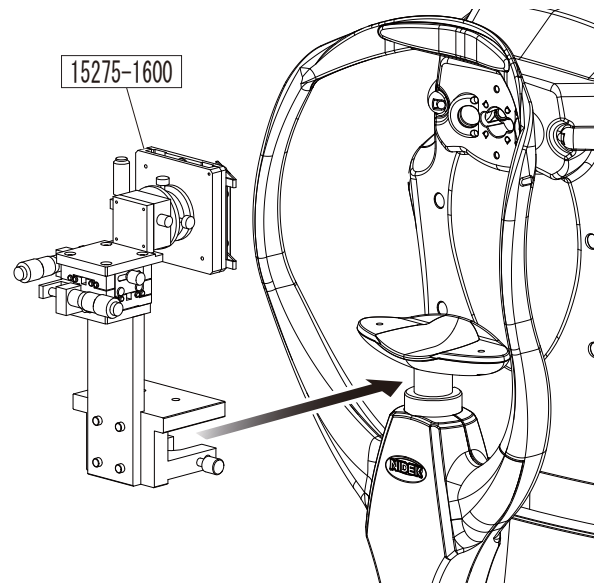


- 3 . Tighten the knurled screw to fasten the calibration jig to the chinrest attachment jig.

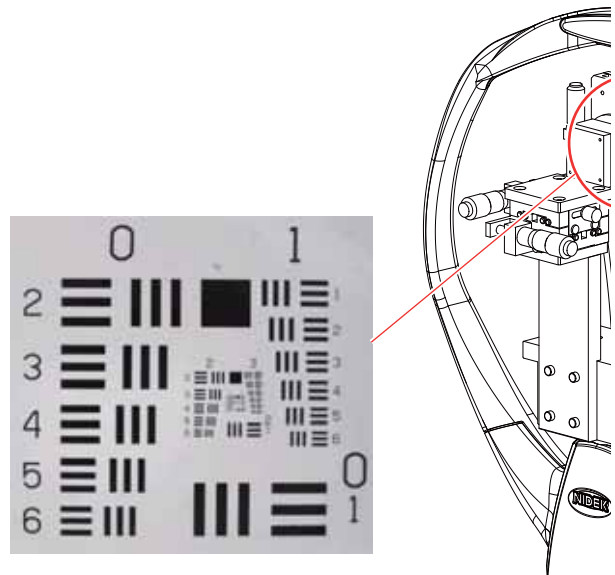


### 8.2.3 Resolution check jig (15275-1600)

- 1 . Move the chinrest to the lowest position.
- 2 . Attach the resolution check jig (15275-1600).

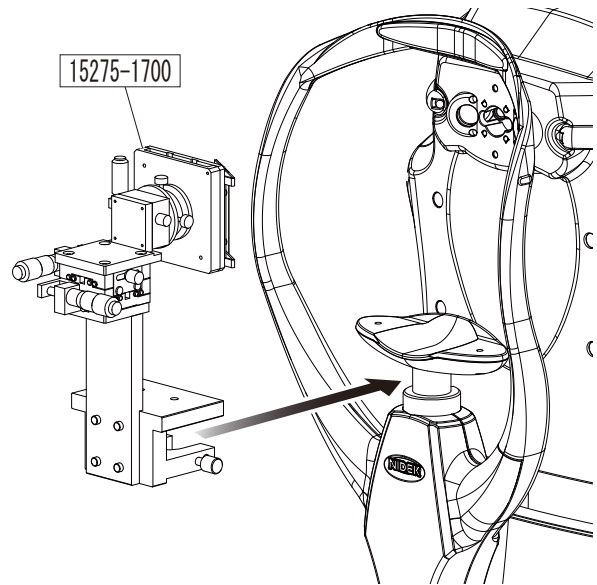


- 3 . Tighten the knurled screw to fasten the jig to the chinrest.

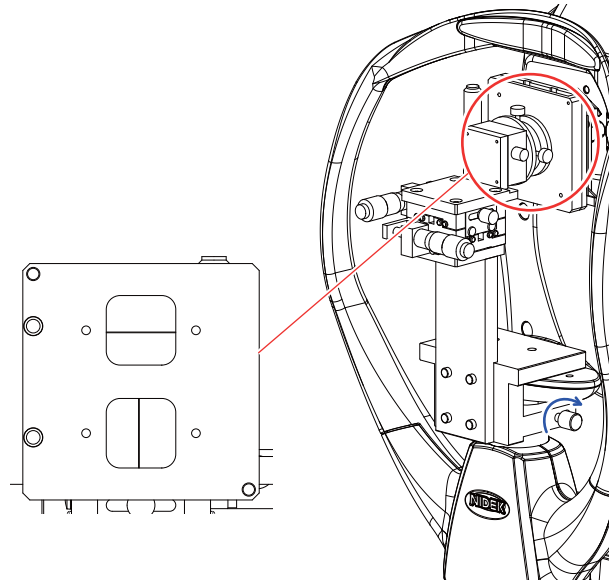


## 8.2.4 Ronchi-ruling check jig (15275-1700)

- 1 . Move the chinrest to the lowest position.
- 2 . Attach the Ronchi-ruling check jig (15275-1700).



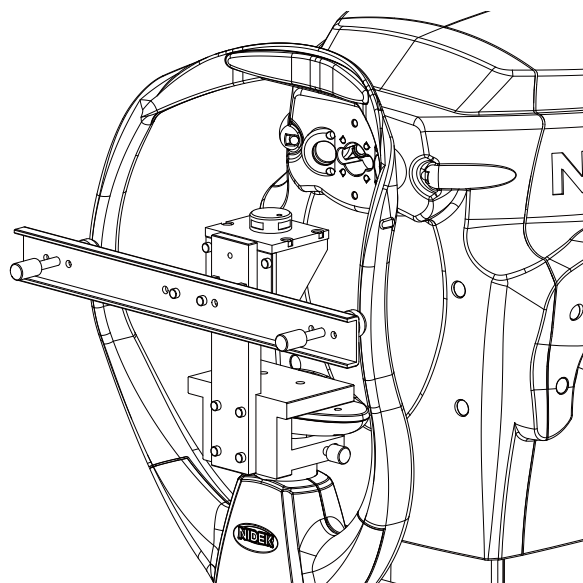
- 3 . Tighten the knurled screw to fasten the jig to the chinrest.



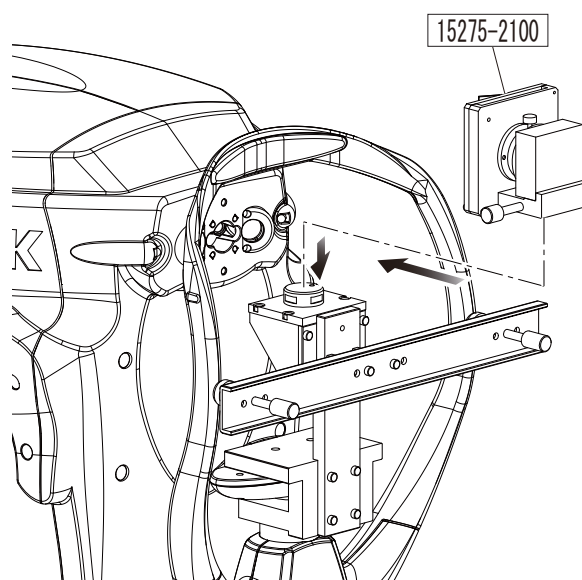


## 8.2.5 Cell model eye jig (15275-2100)

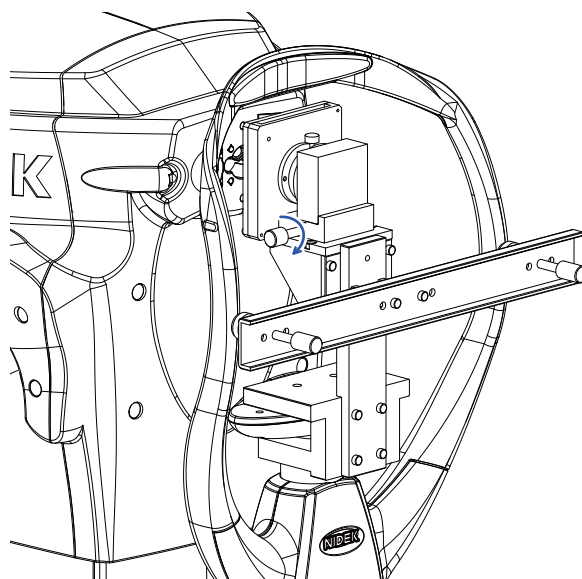
- 1 . Attach the chinrest attachment jig (32188-1100) (see 8.2.1 [p143]).



- 2 . Attach the cell model eye jig (15275-2100) to the chinrest attachment jig (32188-1100).

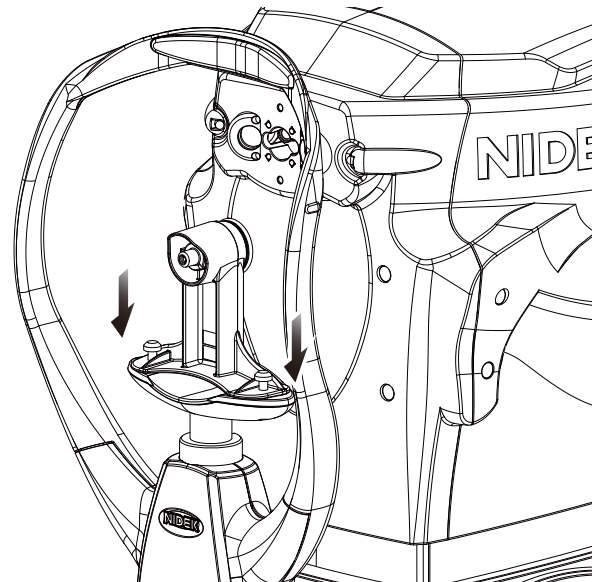
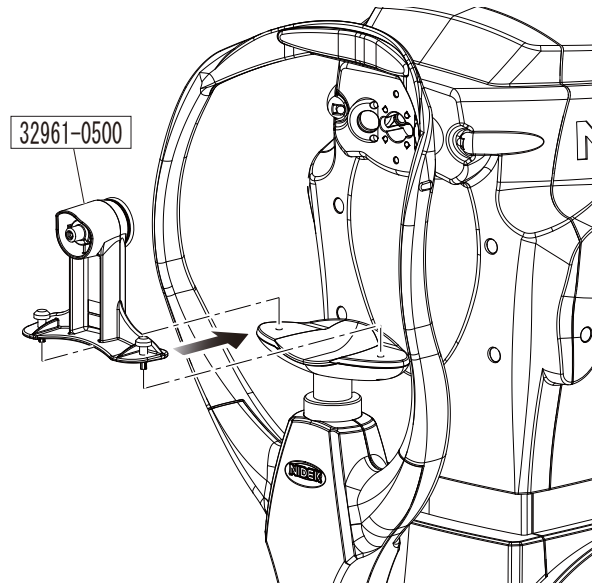


- 3 . Tighten the knurled screw to fasten the cell model eye jig to the chinrest attachment jig.



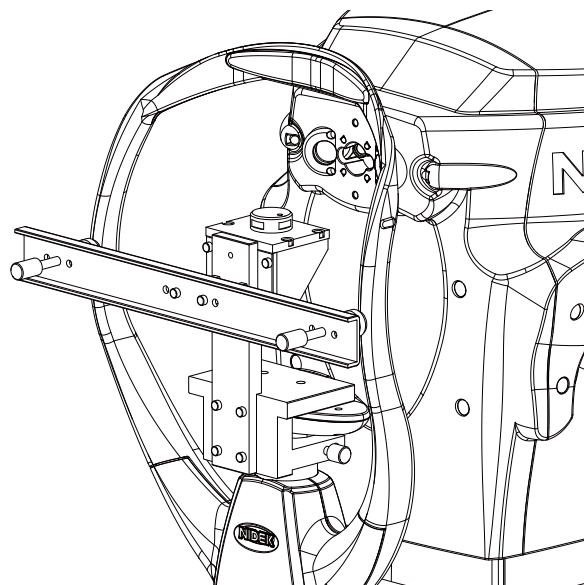
## 8.2.6 Model eye (CL) unit (32961-0500)

- 1 . Attach the model eye (CL) unit (32961-0500) to the chinrest.

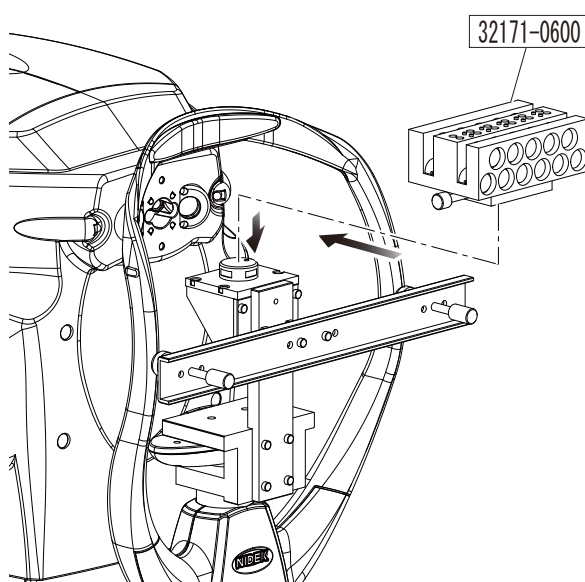


## 8.2.7 22-model eye jig (32171-0600)

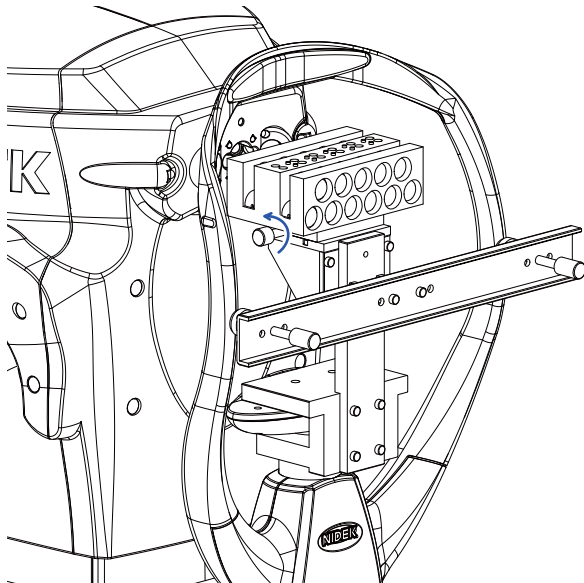
- 1 . Attach the chinrest attachment jig (32188-1100) (see 8.2.1 [p143]).



- 2 . Attach the 22-model eye jig (32171-0600) to the chinrest attachment jig (32188-1100).



- 3 . Tighten the knurled screw to fasten the 22-model eye jig to the chinrest attachment jig.




## 8.3 Checks

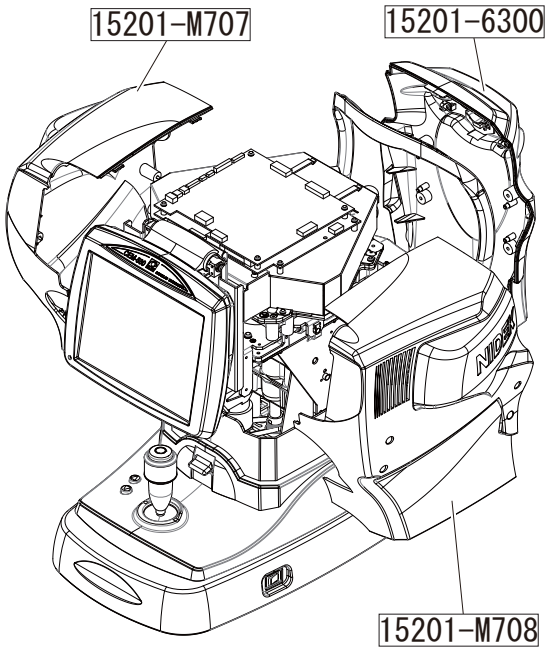
### 8.3.1 Power supply check

Task	Symptom
If the LCD screen does not display anything after power is turned on, identify the trouble location by checking the state of initialization.	5.1 Initial Screen is not Displayed (p11)

#### 8.3.1.1 When turning on power


- 1 . Remove the capturing unit left cover (15201-M707) and capturing unit right cover (15201-M708) (see 6.1 [p53]).
- 2 . Turn on the device.
- 3 . Confirm that LED D6 on the driver board (15201-BA02) illuminates in green (see 9.5.2 [p291]).

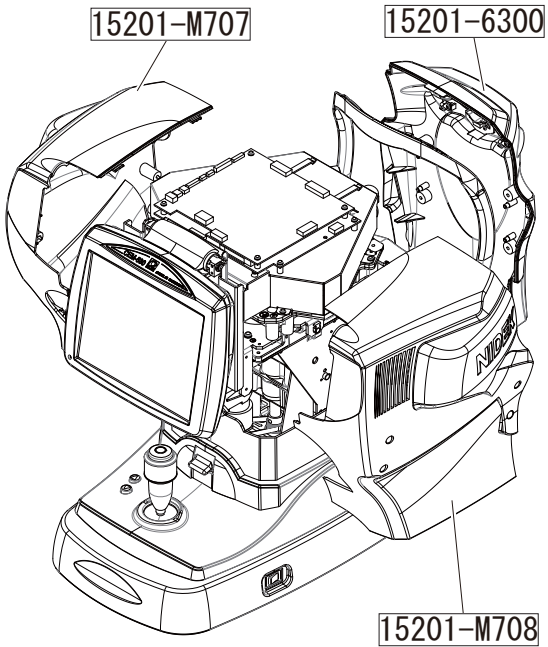
 Note	It is necessary to remove the capturing unit front cover ASSY (15201-6300) once.
----------------------------------------------------------------------------------------	----------------------------------------------------------------------------------



#### 8.3.1.2 Driver board (15201-BA02) voltage check

- 1 . Remove the capturing unit left cover (15201-M707) and capturing unit right cover (15201-M708) (see 6.1 [p53]).
- 2 . Turn on the device.
- 3 . Using a digital multimeter, check the voltages between the test pins on the driver board (15201-BA02) (see 9.5.2 [p291]).

 Note	It is necessary to remove the capturing unit front cover ASSY (15201-6300) once.
------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------



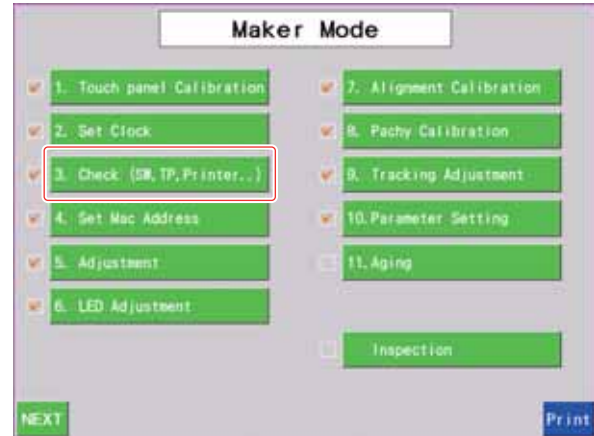
Item	Test pin
+3.3 V	+3.3 V - GND
+5 V	+5 V - GND
+15 V	+15 V - GND

## 8.3.2 Tracking check

Task	Symptom
If the tracking error, auto shot, or auto tracking function does not work properly, specify the detective area using the functions for adjustment.	5.2.3 ERR031 (U/D Motor Error.) (p15)
	5.2.4 ERR032 (R/L Motor Error.) (p17)
	5.2.5 ERR033 (F/B Motor Error.) (p19)

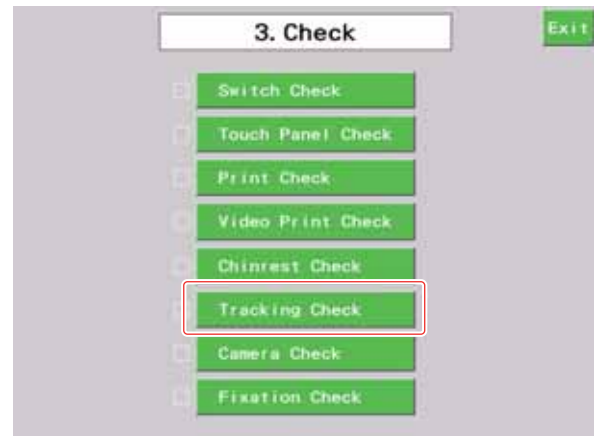
### 8.3.2.1 Tracking function check

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the **3. Check (SW,TP,Printer..)** button.





The 3. Check screen is displayed.

- 3 . Press the **Tracking Check** button.



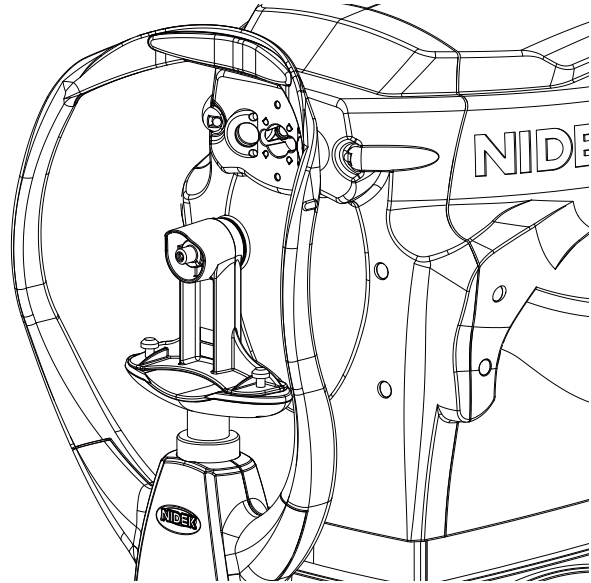
The Tracking Check screen is displayed. Identify the trouble location using the Tracking check function (see 8.3.8 [p162]).

Press the  or  button to select the axis to be checked. When the sensor is activated, the corresponding letter turns pink.



### 8.3.2.2 Auto tracking performance check

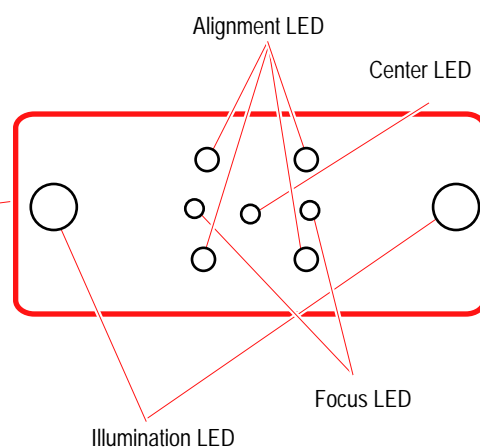
- 1 . Attach the model eye (CL) unit (32961-0500).



- 2 . Turn on the device.
- 3 . Focus the model eye with the joystick and chinrest up and down buttons.



- 4 . Confirm that the LEDs necessary for alignment are lit.



5 . Press the tracking button to enable the 3D

tracking  .



6 . Confirm that the auto tracking function works properly.

Axis	Check method	Criteria
Right/left	Slightly tilt the joystick to the right and left.	Auto alignment works properly. Overshoot does not occur more than four times.
Forward/backward	Slightly push the joystick forward and pull it back.	
Up/down	Turn the joystick knob.	

If the function does not work properly, perform the tracking adjustment (see 8.4.1 [p211]).

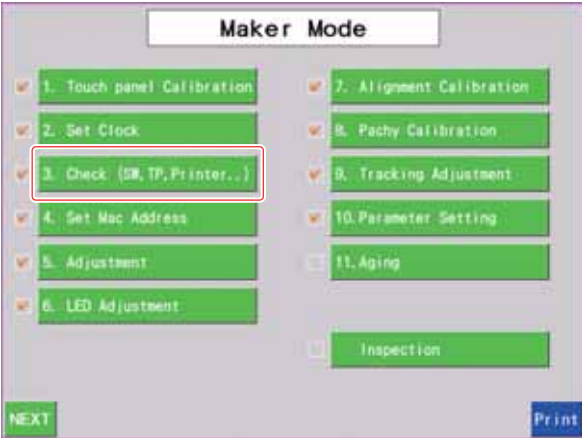


### 8.3.3 Switch check

Task	Symptom
Check the function of the start button. Check the function of the chinrest up and down buttons.	5.7 Chinrest does not Move Up or Down (p35) 5.8.4 Image capture does not start even when start button is pressed (p43) 7.1.6 Joystick ASSY (10701-1260) (p87) 7.3.6 Chinrest (32186-EA53) (p113) 7.2.12 U/D SW board (30601-BA09) (p103) 8.3.11 Joystick check (p175)

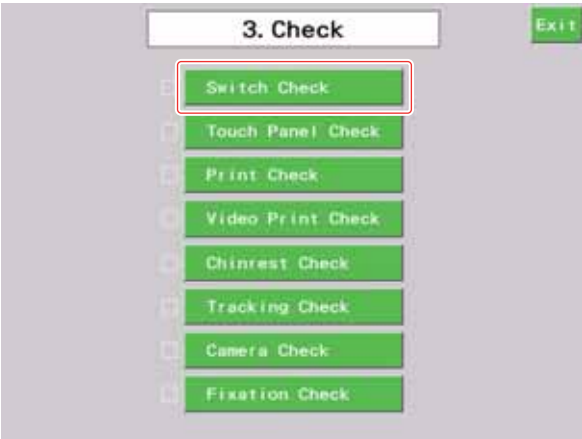
#### 8.3.3.1 Preparation

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.



The 3. Check screen is displayed.

- 3 . Press the Switch Check button.



- 4 . The Switch Check screen is displayed.





### 8.3.3.2 Start button function check

- 1 . Perform the procedure as in “8.3.3.1 Preparation” (p154).
- 2 . Press the start button.
- 3 . “Please Push Measure SW” changes to “Measure SW OK” in green.



Note

If pressing the start button does not change the color of the letters, the following parts may be defective.

- Joystick ASSY (10701-1260)
- U/D SW board (30601-BA09)
- U/D unit cable (15201-CA05)
- Connection board (15201-BA08)
- Relay cable (15201-CA28)
- Driver board (15201-BA02)
- Main board (15201-BA01)

### 8.3.3.3 Chinrest up and down button function check

- 1 . Perform the procedure as in “8.3.3.1 Preparation” (p154).
- 2 . Press the chinrest up button.
- 3 . “Please Push Measure SW” changes to “Chinrest UP SW OK” in green.
- 4 . Press the chinrest up button.
- 5 . “Please Push Measure SW” changes to “Chinrest UP SW OK” in green.



Note

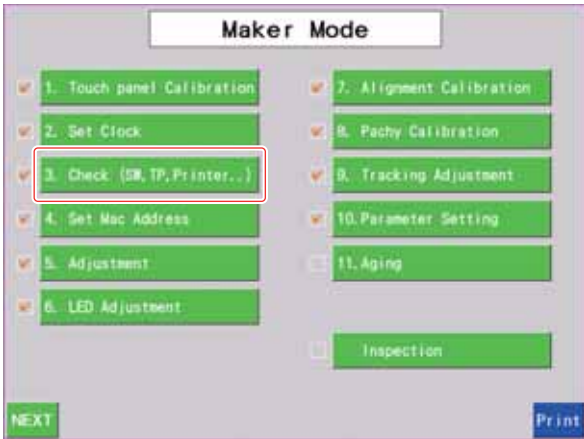
If pressing the chinrest up and down buttons does not change the color of the letters, the following parts may be defective.

- U/D SW board (30601-BA09)
- U/D unit cable (15201-CA05)
- Connection board (15201-BA08)
- Relay cable (15201-CA28)
- Driver board (15201-BA02)
- Main board (15201-BA01)

8.3.4 Touch panel check

Task	Symptom
Check the touch panel function.	5.3 Screen Touch Panel is not Operational (p30)

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.



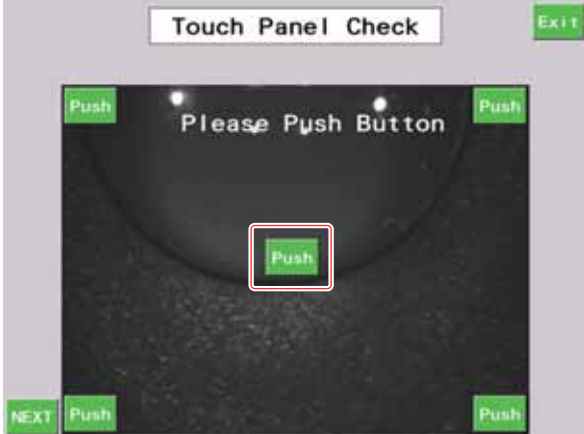
The 3. Check screen is displayed.

- 3 . Press the Touch Panel Check button.



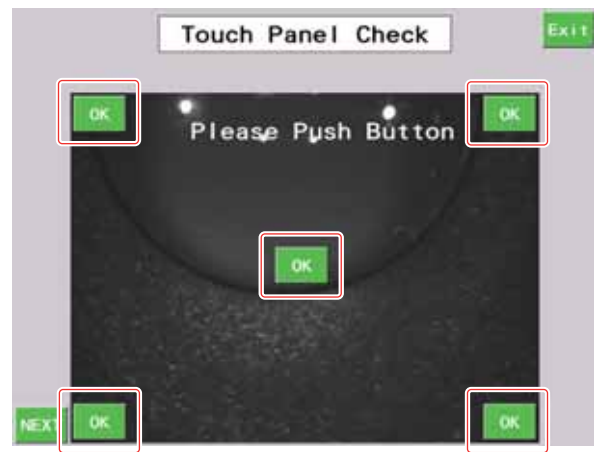
The Touch Panel Check screen is displayed.

- 4 . Press the five Push buttons on the screen in turn.



Push changes to OK .





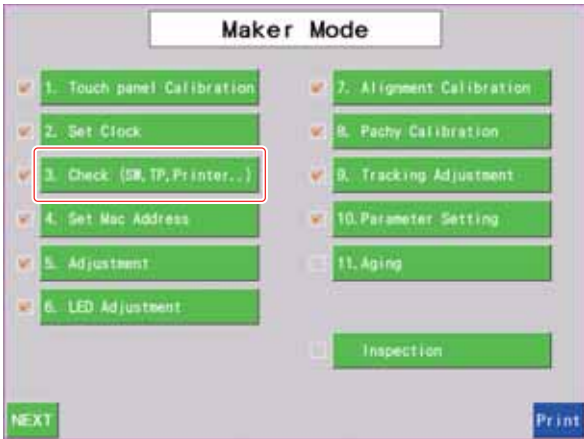
Note

- If the button does not change to "OK"
- Touch panel calibration is not performed properly.
  - The following parts may be defective.
    - LCD (14101-E010)
    - LCD cable (14101-CA13)
    - Main board (15201-BA01)

8.3.5 Print check

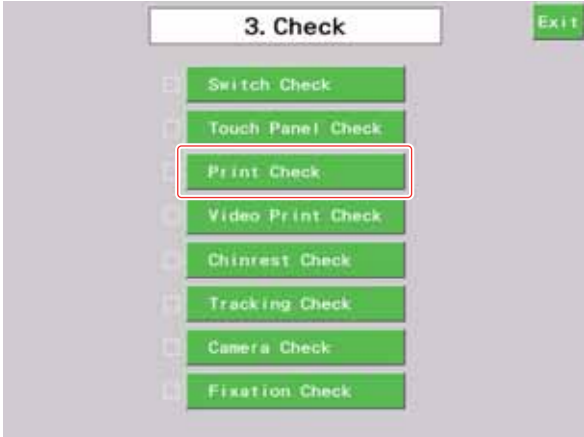
Task	Symptom
Check the printer operation.	5.10 Printing cannot be Performed (p49)

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.



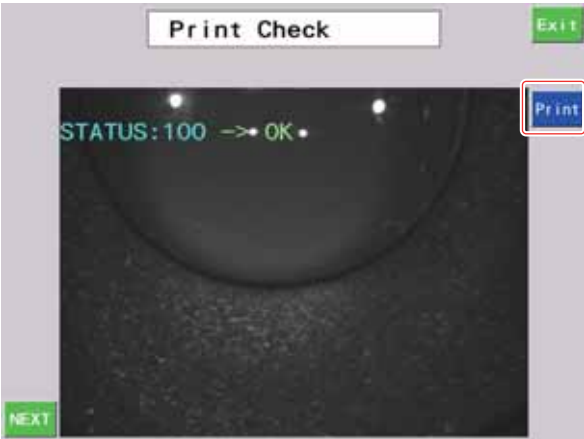
The 3. Check screen is displayed.

- 3 . Press the Print Check button.



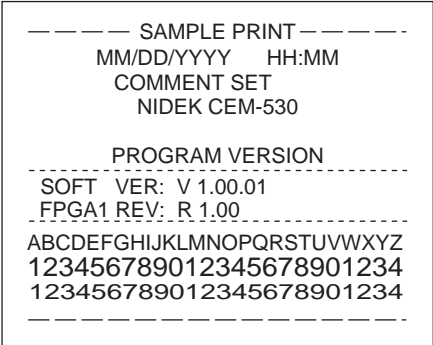
The Print Check screen is displayed.

- 4 . Press the Print button.



Sample print occurs.

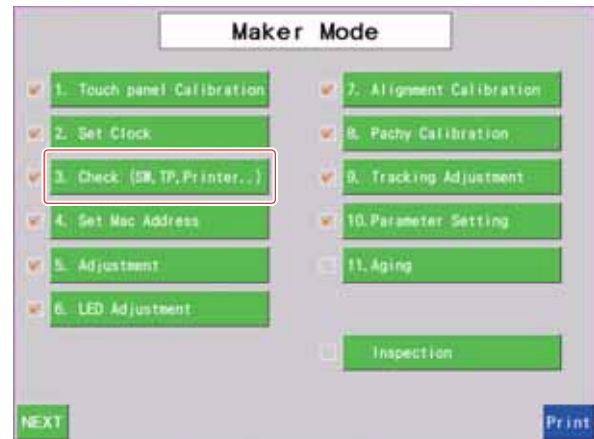
- 5 . Confirm printing quality.



### 8.3.6 Video print check

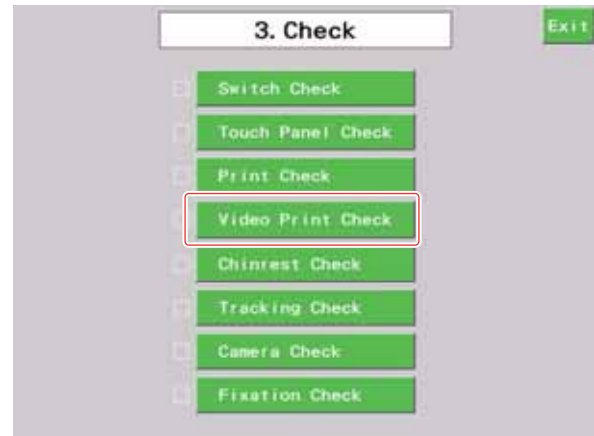
Task	Symptom
Check the video printer function.	5.10 Printing cannot be Performed (p49)

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the **3. Check (SW,TP,Printer..)** button.



The 3. Check screen is displayed.

- 3 . Press the **Video Print Check** button.



The Video Print Check screen is displayed.

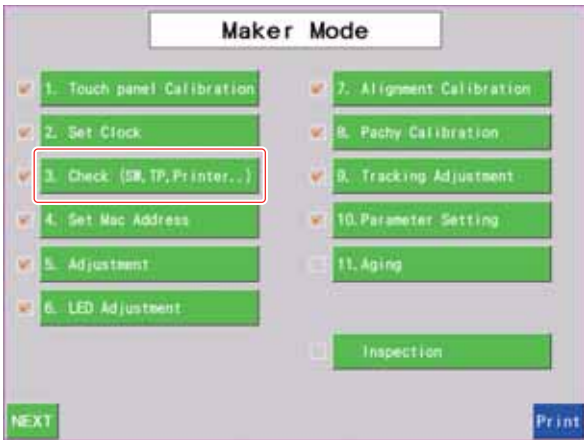
- 4 . Press the **Print** button.  
Sample print occurs.  
Confirm printing quality.



### 8.3.7 Chinrest check

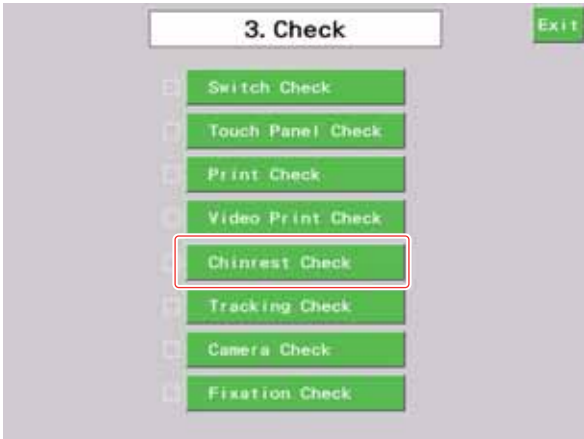
Task	Symptom
Check the functions of the chinrest U/D motor and sensor.	5.7 Chinrest does not Move Up or Down (p35)

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.

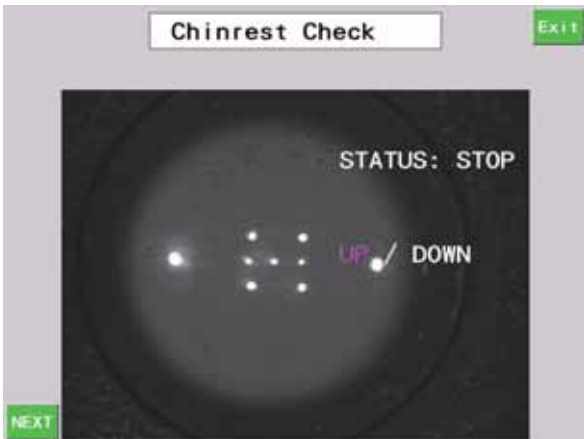


The 3. Check screen is displayed.

- 3 . Press the Chinrest Check button.




The Chinrest Check screen is displayed.



4 . Each display and its function are listed as below.



Item	Display	State
①	STATUS: STOP	The chinrest up or down button is not pressed.
	STATUS: UP	The chinrest up button is pressed. The chinrest goes up until the chinrest up limit sensor is activated.
	STATUS: DOWN	The chinrest down button is pressed. The chinrest goes down until the chinrest down limit sensor is activated.
②	UP LIMIT	Displayed when the chinrest up limit sensor is active.
③	UP/DOWN	"UP" is displayed in pink when the chinrest up/down limit sensor is active.
④	DOWN LIMIT	Displayed when the chinrest down limit sensor is active.

 Note	<p>If any physically impossible state is displayed, sensor failure or cable breakage can be identified as a cause of failure.</p> <p>For example:</p> <p>The chinrest up and down limit sensors are activated simultaneously.</p> <p>The chinrest up/down position sensor and down limit sensor are activated simultaneously.</p>
------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 8.3.8 Tracking check

Task	Symptom
Check the functions of the capturing unit U/D motor and sensor. Check the functions of the capturing unit R/L motor and sensor. Check the functions of the capturing unit F/B motor and sensor. Check the function of the capturing unit R/L position sensor.	5.2.3 ERR031 (U/D Motor Error.) (p15) 5.2.4 ERR032 (R/L Motor Error.) (p17) 5.2.5 ERR033 (F/B Motor Error.) (p19) 5.12 Right and Left Eyes cannot be Detected (p51)

#### 8.3.8.1 Preparation

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.

The 3. Check screen is displayed.

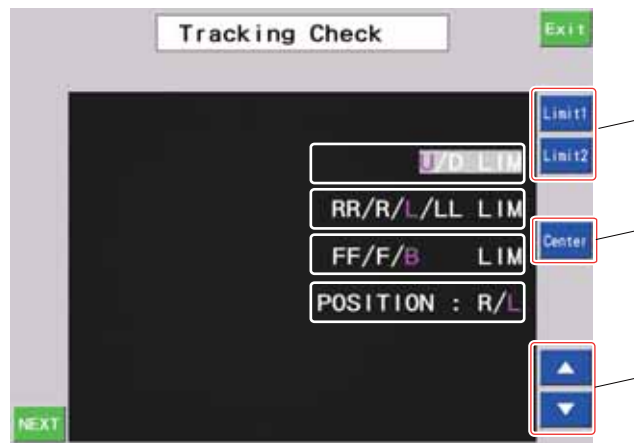
- 3 . Press the Tracking Check button.

The Tracking Check screen is displayed.



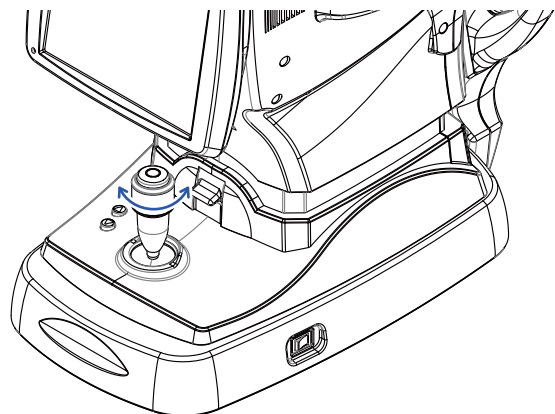


Each display and its function is listed as below.



Item	Display	Function
①	U/D LIM	Displays the state of the tracking U/D sensor.
②	RR/R/L/LL LIM	Displays the state of the tracking R/L sensor.
③	FF/F/B	Displays the state of the tracking F/B sensor.
④	POSITION: R/L	Displays the state of the right and left eye detection sensor.
⑤	Limit1 Limit2	Moves to the limit.
⑥	Center	Moves to the center.
⑦	▲ ▼	Selects the axis to be controlled.

Turning the joystick knob allows moving the selected axis.





### 8.3.8.2 Tracking U/D check



The trouble location can be identified by the sensor state and motor operation.  
If the sensor is defective (cable breakage), the sensor indication remains pink (active).

- 1 . Perform the procedure as in “8.3.8.1 Preparation” (p162).

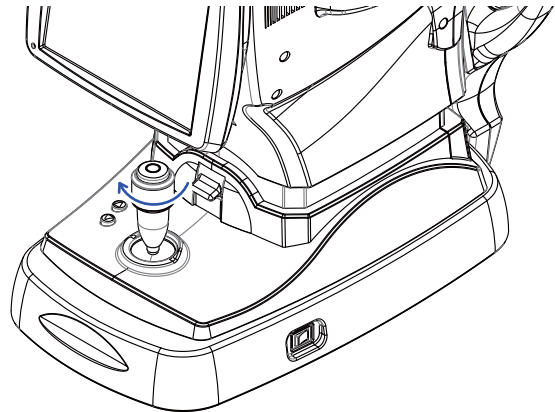
The Tracking Check screen is displayed.

- 2 . Press the  or  button to select “U/D LIM”.



- 3 . Each display and its function are as follows:

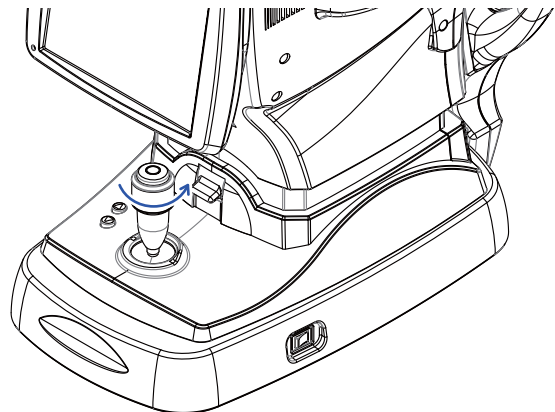
- 1 ) Turning the joystick knob clockwise raises the capturing unit.



- 2 ) When the unit reaches the upper limit, “LIM” turns pink and the unit no longer goes up.




- 3 ) Turning the joystick knob counter-clockwise lowers the capturing unit.



- 4 ) When the unit reaches the lower limit, “LIM” turns pink and the unit no longer goes down.



- 5 ) Pressing the  button raises the capturing unit to the upper limit.



- 6 ) Pressing the **Limit2** button raises the capturing unit to the upper limit.



- 7 ) Pressing the **Center** button moves the capturing unit to the center.



The motors for the capturing unit stop at the position where the indication of the U/D position sensor switches between “U” and “D”.



### 8.3.8.3 Tracking R/L check



The trouble location can be identified by sensor state and motor operation.  
If the sensor is defective (cable breakage), the sensor indication remains pink (active).

- 1 . Perform the procedure as in “8.3.8.1 Preparation” (p162).

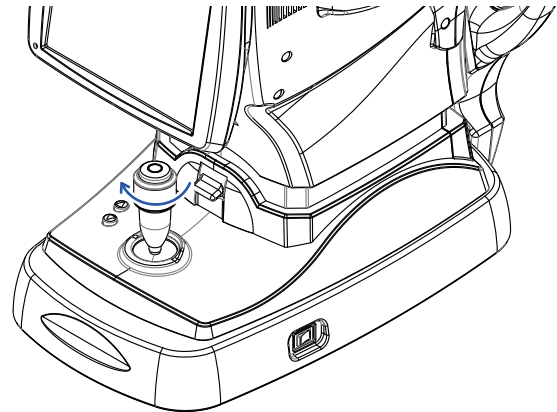
The Tracking Check screen is displayed.

- 2 . Press the  or  button to select “RR/R/L/LL LIM”.



- 3 . Each display and its function are as follows:

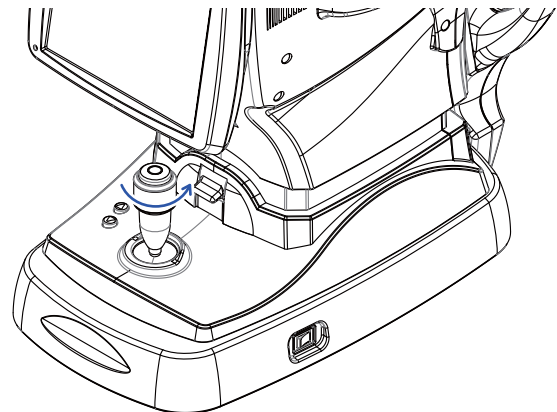
- 1 ) Turning the joystick knob clockwise moves the main unit to the right.



- 2 ) When the unit reaches the right limit, “LIM” turns pink and the unit no longer moves.



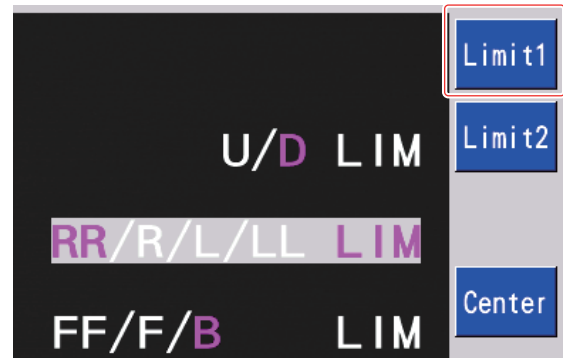
- 3 ) Turning the joystick knob counter-clockwise moves the unit to the left.



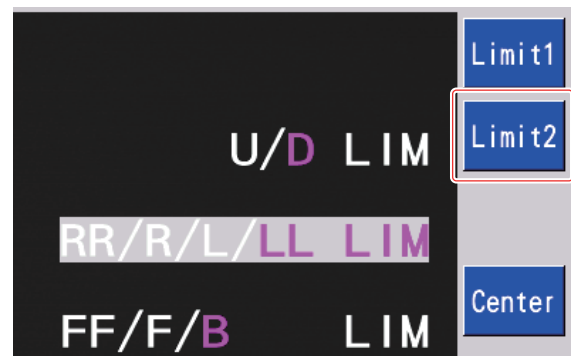
- 4 ) When the unit reaches the left limit, “LIM” turns pink and the unit no longer moves.



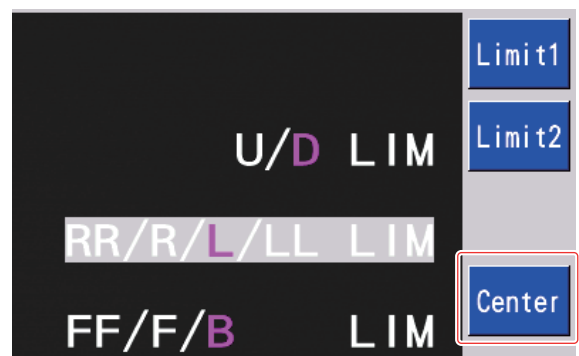
- 5 ) Pressing the **Limit1** button moves the main unit to the right limit.



- 6 ) Pressing the **Limit2** button moves the main unit to the left limit.



- 7 ) Pressing the **Center** button moves the main unit to the center.



The motors for the capturing unit stop at the position where the indication of the R/L position sensor switches between “R” and “L”.



### 8.3.8.4 Tracking F/B check

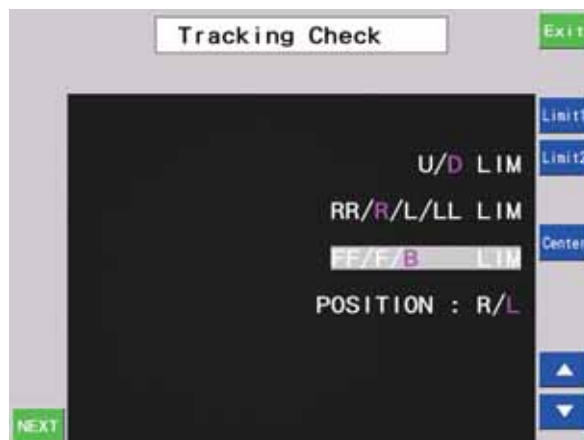


The trouble location can be identified by sensor state and motor operation.  
If the sensor is defective (cable breakage), the sensor indication remains pink (active).

- 1 . Perform the procedure as in “8.3.8.1 Preparation” (p162).

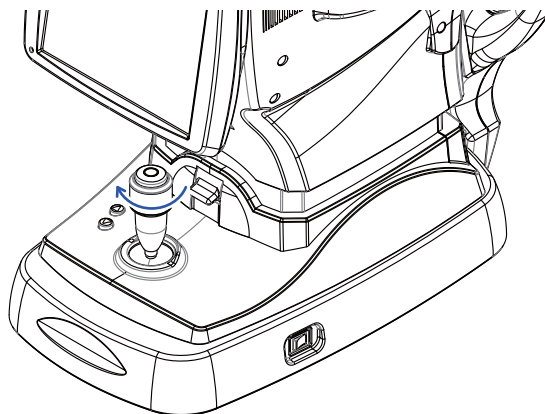
The Tracking Check screen is displayed.

- 2 . Press the  or  button to select “FF/F/B”.



- 3 . Each display and its function are as follows:

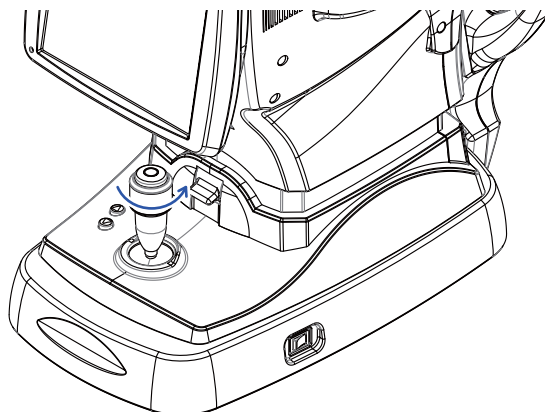
- 1 ) Turning the joystick knob clockwise moves the main unit forward (toward the patient).



- 2 ) When the unit reaches the front limit, “LIM” turns pink and the unit no longer moves forward.



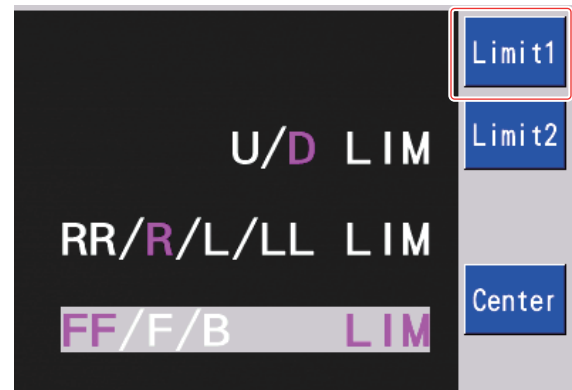
- 3 ) Turning the joystick knob counter-clockwise moves the main unit backward (toward the operator).



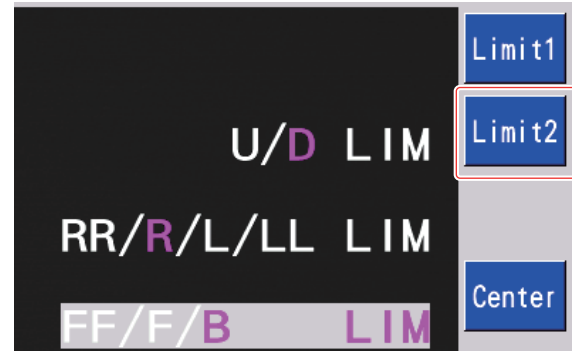
- 4 ) When the unit reaches the back limit, “LIM” turns pink and the unit no longer moves backward.



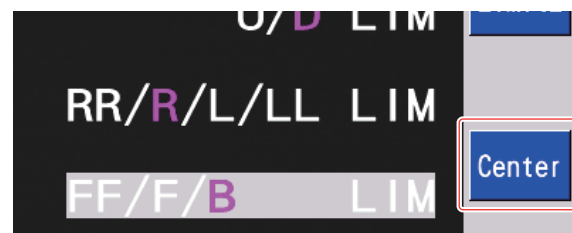
- 5 ) Pressing the **Limit1** button moves the main unit to the front limit.



- 6 ) Pressing the **Limit2** button moves the main unit to the back limit.



- 7 ) Pressing the **Center** button moves the main unit to the center.



The motors for the capturing unit stop at the position where the indication of the F/B position sensor switches between "F" and "B".



### 8.3.8.5 Right and left eye detection check



If any physically impossible state is displayed, sensor failure or cable breakage can be identified as a cause of failure.  
When the sensor cable breakage is the cause, "R" remains pink (active).

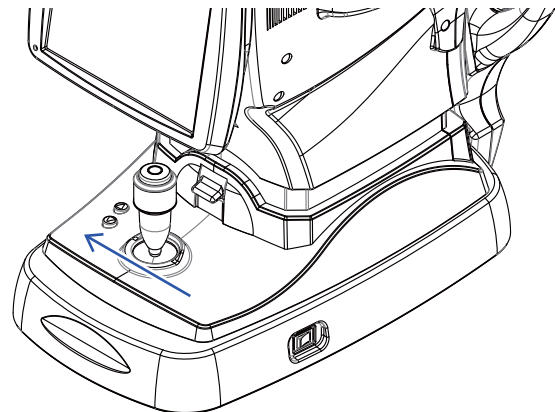
- 1 . Perform the procedure as in "8.3.8.1 Preparation" (p162).

The Tracking Check screen is displayed.



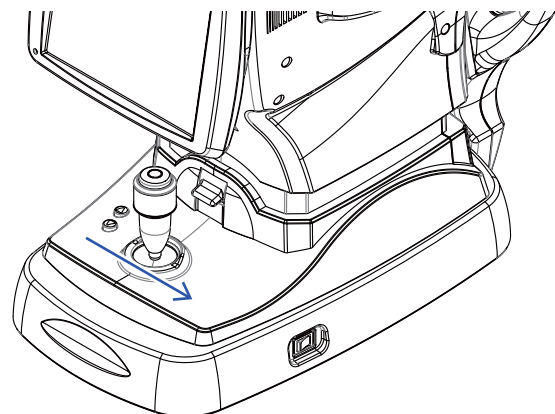
- 2 . Each display and its function are as follows:

- 1 ) Moving the capturing unit to the left with the joystick turns "R" (right eye) pink.



POSITION : R/L

- 2 ) Moving the capturing unit to the right with the joystick turns "L" (left eye) pink.



POSITION : R/L

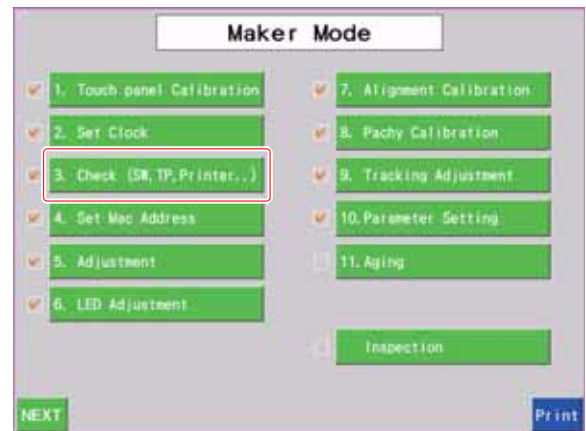


### 8.3.9 Camera check

Task	Symptom
Check the camera.	5.8.1 Observation image is not displayed on screen (p39) 5.8.6 Captured image is not displayed on screen (p45)

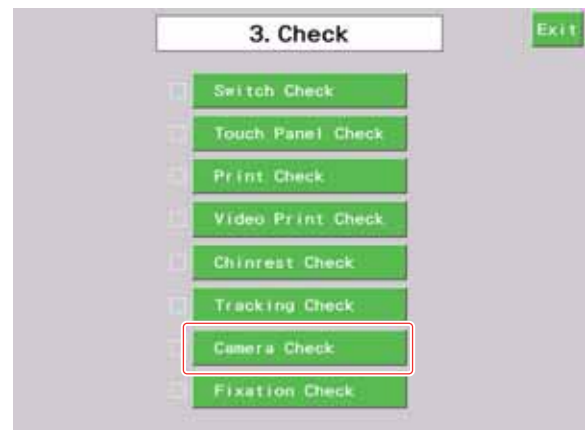
1 . Activate Maker mode (see 8.1 [p137]).

2 . Press the **3. Check (SW,TP,Printer..)** button.



The 3. Check screen is displayed.

3 . Press the **Camera Check** button.

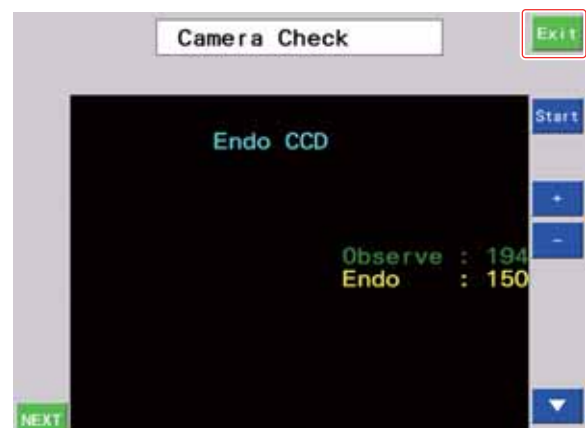


The Camera Check screen for observation is displayed.

4 . Press the  button.



The Camera Check screen for capture is displayed.

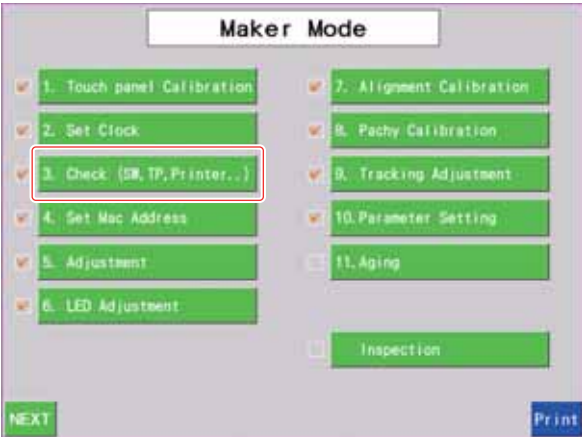


5 . Press the **Exit** button.  
Return to the 3. Check screen.

8.3.10 Fixation check

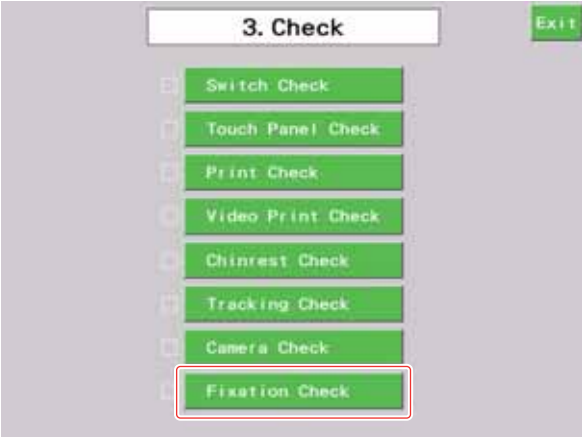
Task	Symptom
Check the fixation lamp function.	5.6 Fixation Lamp does not Illuminate (p33)

- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the 3. Check (SW,TP,Printer..) button.



The 3. Check screen is displayed.

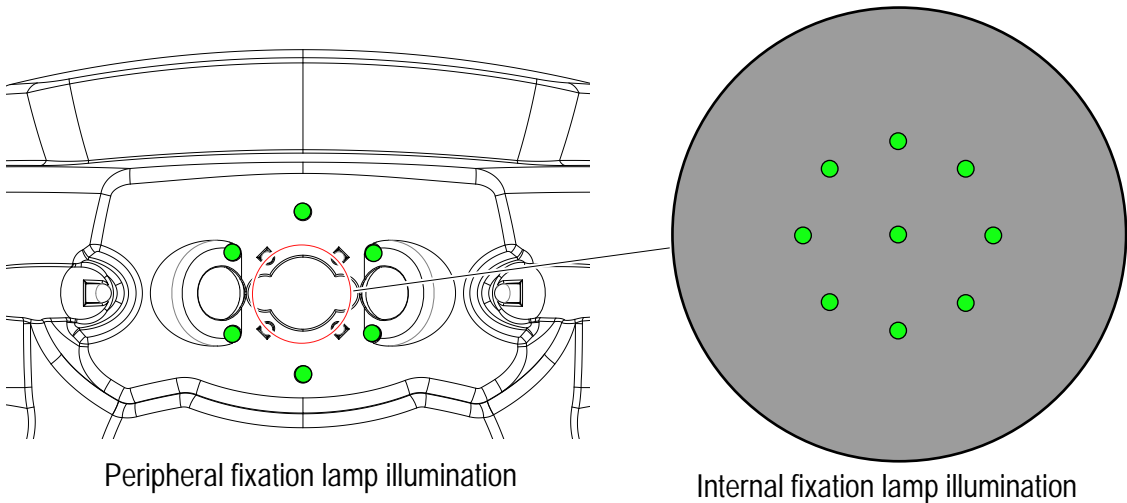
- 3 . Press the Fixation Check button.



The Fixation Check screen is displayed.



4 . Confirm that all points of the fixation lamps are lit.

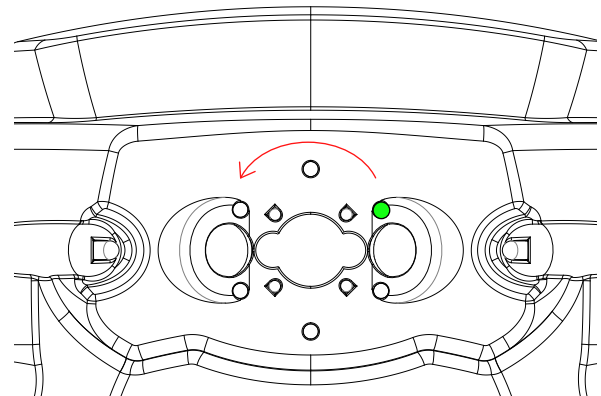
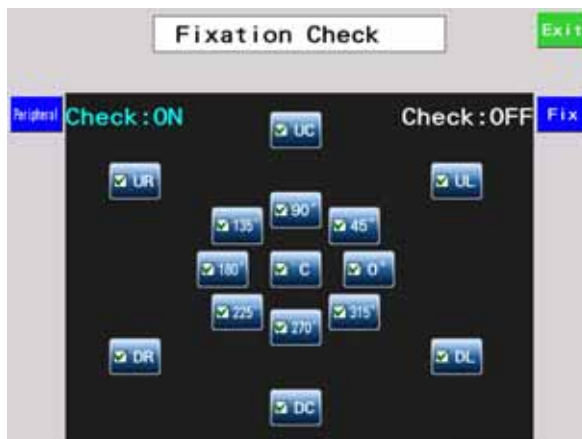


5 . Press the **Peripheral** button.



“Check: ON” is activated and the peripheral fixation lamp illuminates individually counter-clockwise.

6 . Confirm that the peripheral fixation lamp illuminates properly.



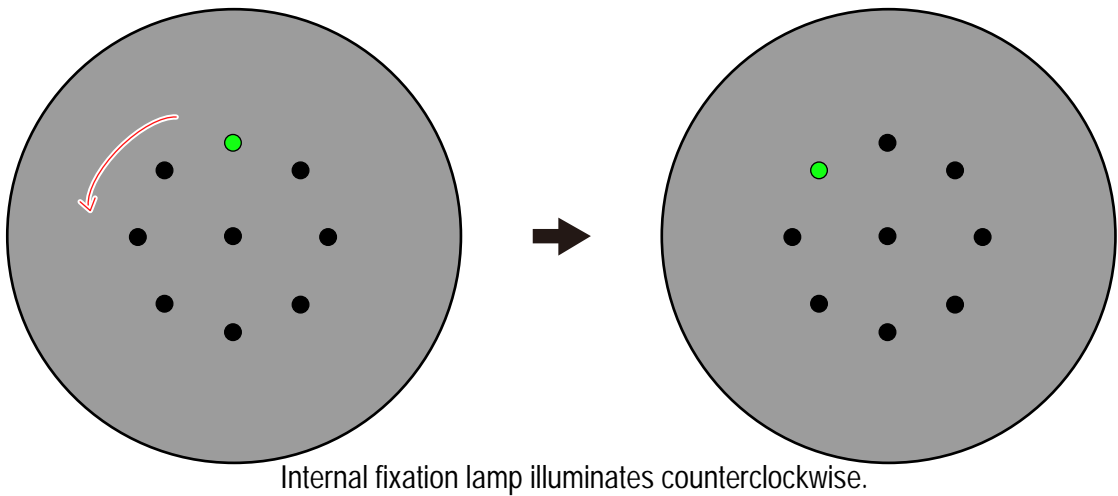
Peripheral fixation lamp illuminates counterclockwise.

7 . Press the **Fix** button.

“Check: ON” is activated and the internal fixation lamp illuminates individually counterclockwise.



8 . Confirm that the internal fixation lamp illuminates individually counterclockwise.



9 . Press the **Exit** button.



The 3. Check screen is displayed again.



### 8.3.11 Joystick check

Task	Symptom
If the joystick does not operate properly, identify the trouble location.	5.5 Capturing Unit does not Move Up or Down even when Joystick is Turned (p32)

#### 8.3.11.1 Capturing unit is not moved up or down by turning the joystick knob

- 1 . Turn off the device.
- 2 . Remove the capturing unit left cover (15201-M707) and capturing unit right cover (15201-M708) (see 6.1 [p53]).

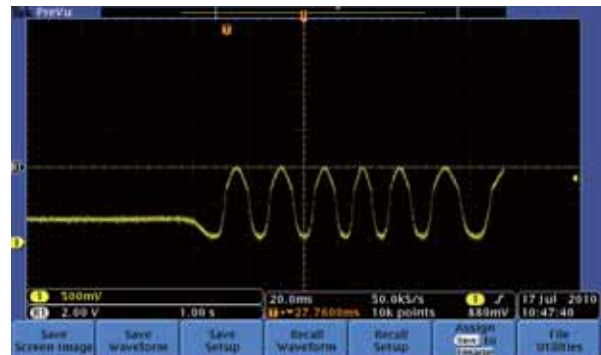
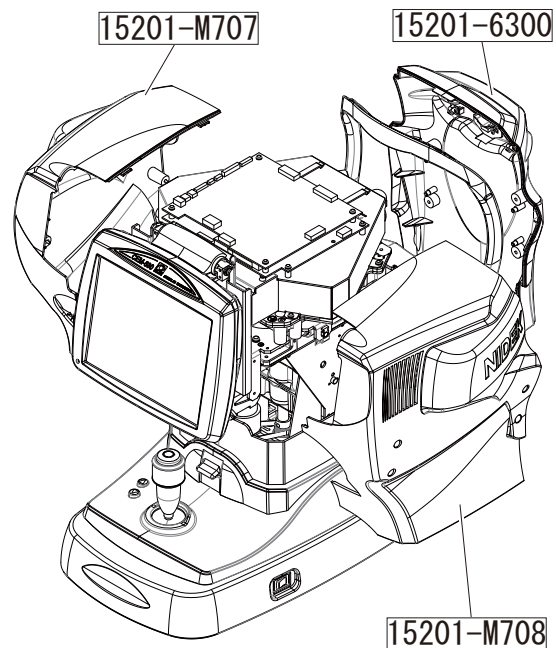


It is necessary to remove the capturing unit front cover ASSY (15201-6300) once and attach it again.

- 3 . Connect an oscilloscope to J4-15 pin on the driver board (15201-BA02) (see 9.5.2 [p291]).  
Set the oscilloscope to 500 mV, 20 ms range, trigger level 600 to 800 mV.
- 4 . Turn on the device.
- 5 . Activate Measurement mode.  
Turn the joystick knob.
- 6 . Check the waveform.

If the waveform is as shown to the right, it is proper.


The wavelength varies depending on the rotation speed of the joystick knob.



- 7 . Connect the oscilloscope to J4-16 pin on the driver board (15201-BA02) to check the waveform the same as above (see 9.5.2 [p291]).

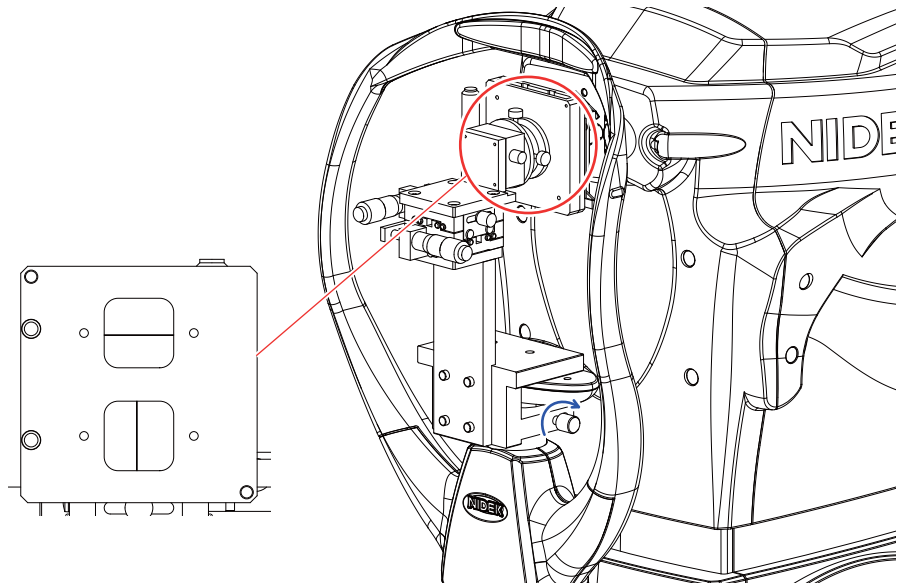
### 8.3.12 Endothelium measurement accuracy check

Task	Symptom
Check the accuracy of endothelium measurement.	5.8.7 Endothelium measurement data is not within normal range (p46)

 <b>Caution</b>	If the jig is not clean, measurement cannot be performed properly. To check high-accuracy measurement, use the Ronchi-ruling check jig (15275-1700) and start from checking the Capture area setting. This step requires very delicate work. Subtle vibration or slight misalignment prevents proper accuracy check.
--------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

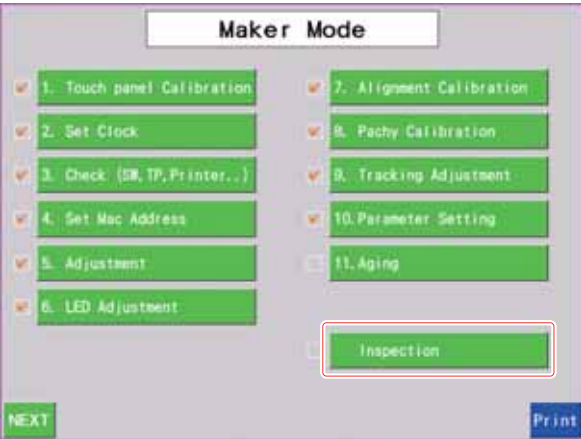
#### 8.3.12.1 Check capture area

1 . Attach the Ronchi-ruling check jig (15275-1700) (see 8.3.4 [p156]).



2 . Activate Maker mode (see 8.1 [p137]).

3 . Press the  button.



4 . The Inspection screen is displayed.

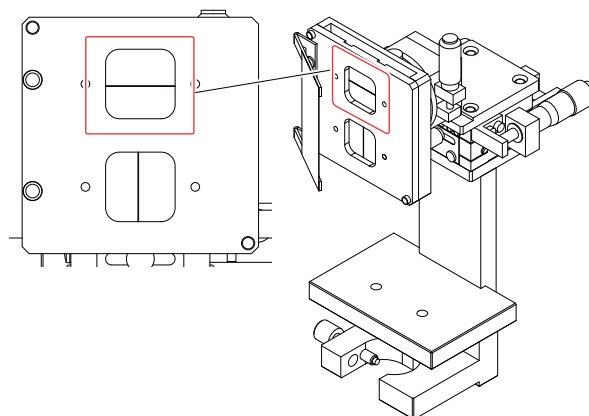
5 . Press the **1. Check Capture Area** button.



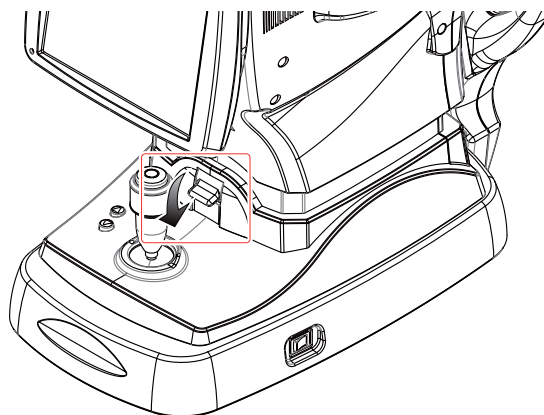
The 1.1 Slit Width screen is displayed.



6 . Align the capturing unit almost to the center of the upper window of the Ronchi-ruling check jig (15275-1700) with the joystick.



7 . When coarse alignment is complete, lower the locking lever.





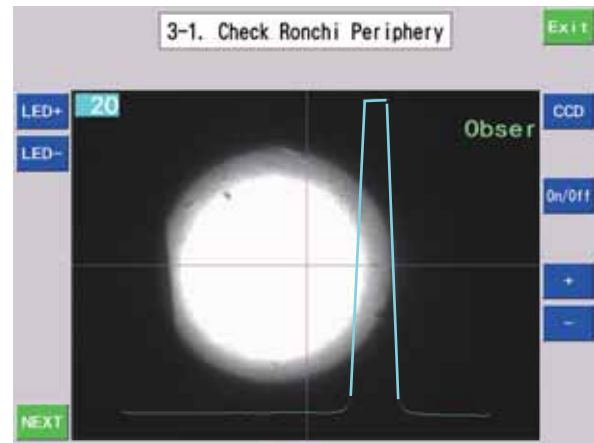
- 8 . Check whether the Ronchi-ruling check jig (15275-1700) is attached vertically.  
When the jig is vertical, received light appears symmetrical.

⚠ Caution

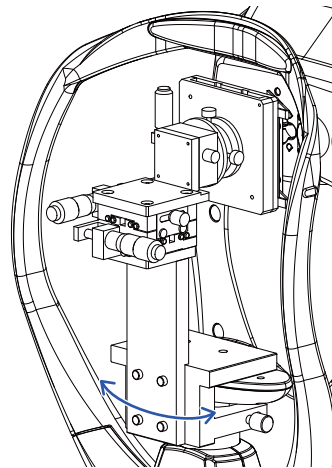
If the amount of reflection light is too much and the screen turns completely white, press the

**LED-**

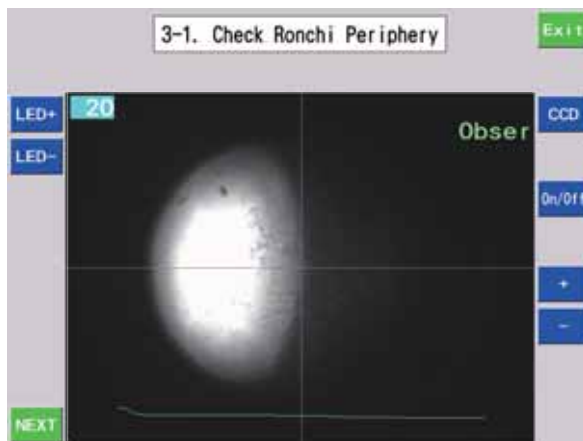
button to reduce the light amount.



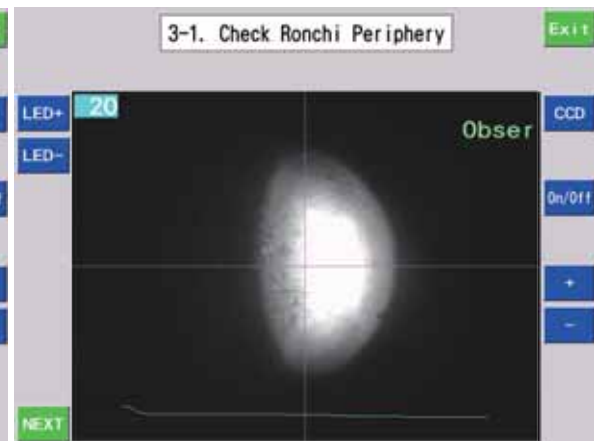
If the jig is tilted, adjust the position of the Ronchi-ruling check jig (15275-1700) so that received light appears symmetrical.



When tilted to the right

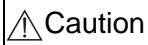


When tilted to the left





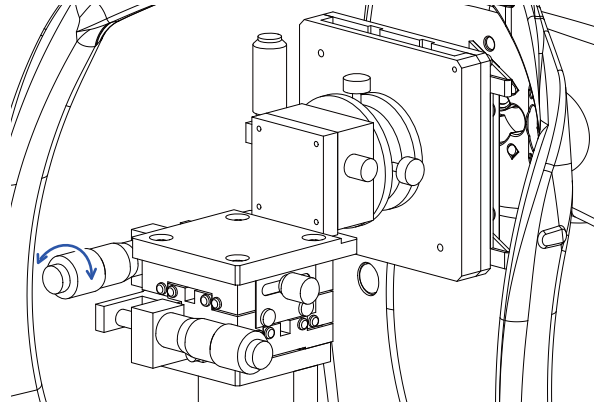
## 9 . Adjust the focus.



Caution

If vibration occurs around the device, loss of focus will result.  
It is necessary to perform the task in a quiet place.

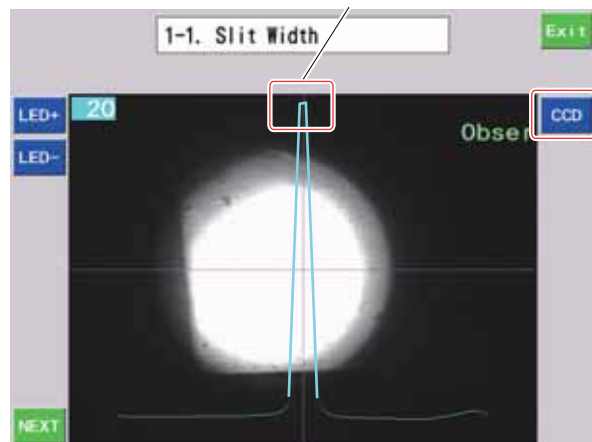
- 1 ) Move the jig forward and backward with the Z axis micrometer of the jig.



Peak of the CCD signal

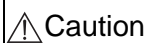
- 2 ) Align the peak of the CCD signal (light blue line) to the vertical line of the electric reticle (purple line).

- 3 ) Press the **CCD** button.



An endothelial image (Endo) captured by the camera is displayed.

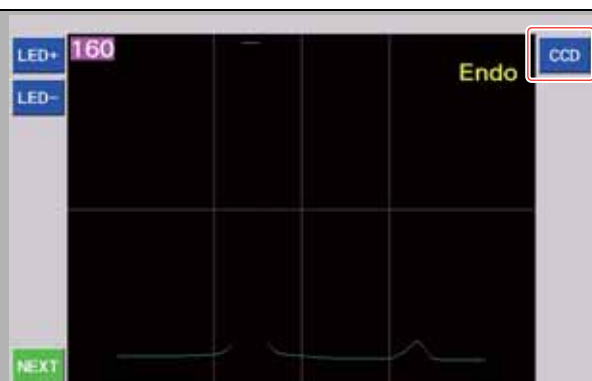
- 4 ) Confirm that horizontal lines appear as a band.



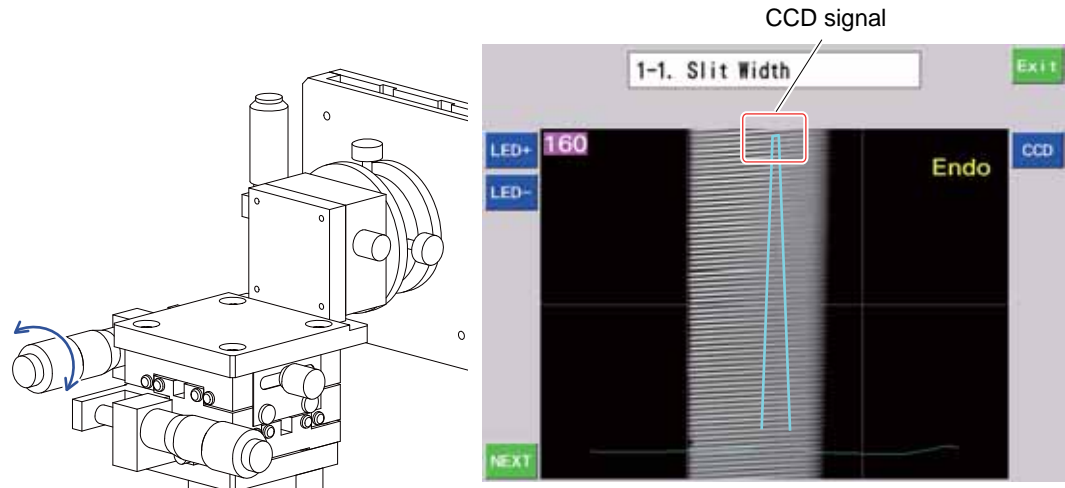
Caution

If the screen turns completely black, focus is not proper.

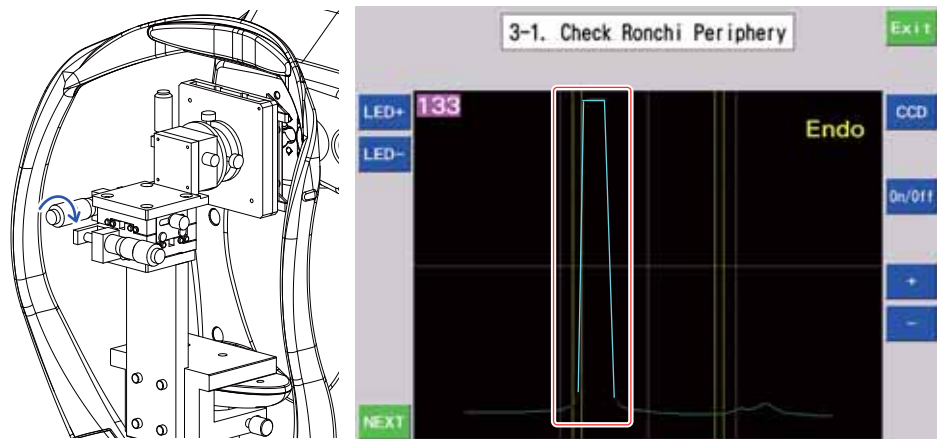
Press the **CCD** button to switch the camera.  
Focus needs to be readjusted.



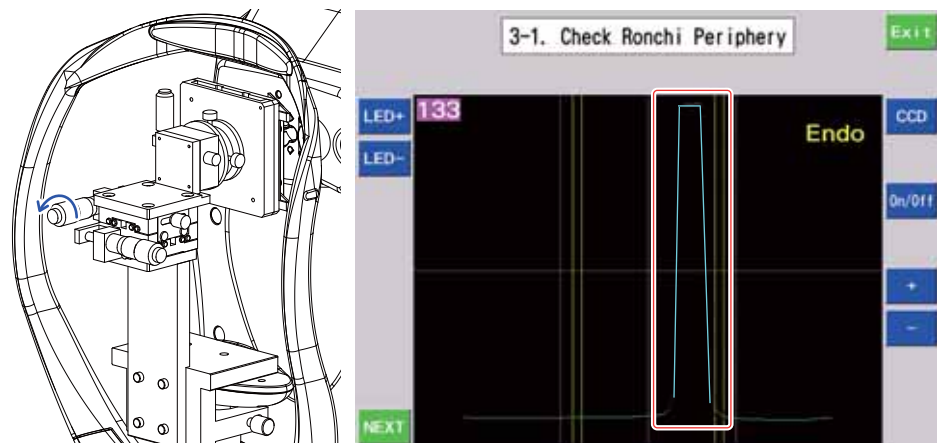
10. Adjust the focus so that the CCD signal (light blue line) aligns to the vertical line of the electric reticle (purple line).



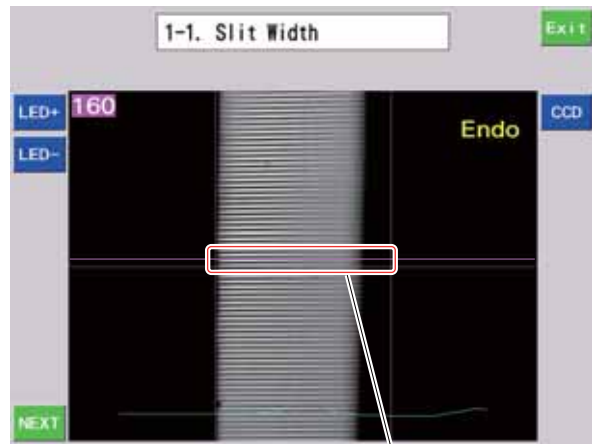
- a. When the peak appears to the left  
Turn the Z axis micrometer of the jig counterclockwise.



- b. When the peak appears to the right  
Turn the Z axis micrometer of the jig clockwise.

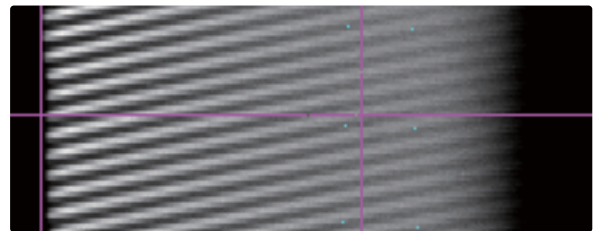
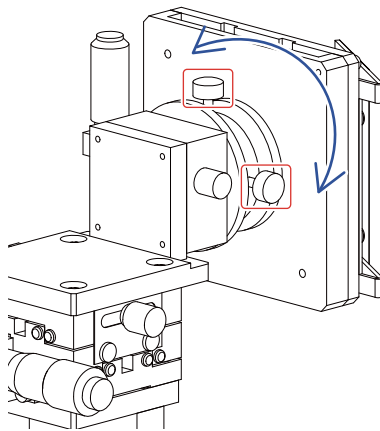


11. Confirm that the horizontal lines of the image are parallel to the horizontal line of the reticle.

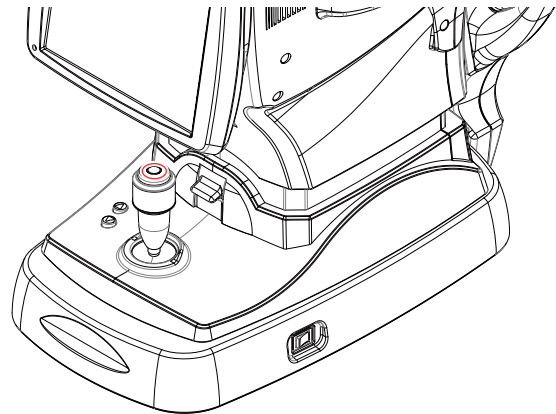


Parallel to the electric reticle



- 1) If they are tilted, loosen the knurled screw of the jig to adjust the lines to be parallel.





12. Press the start button of the joystick.




The screen is captured.

13. Press the  or  button to align the light blue line on the left to the left edge of the band.



14. Press the  or  button to align the light blue line on the right to the right edge of the band.



 **Note** This task is performed on the screen with large magnification. Considering the image shaking, tilt, and blur, align the light blue lines around the center of the band.

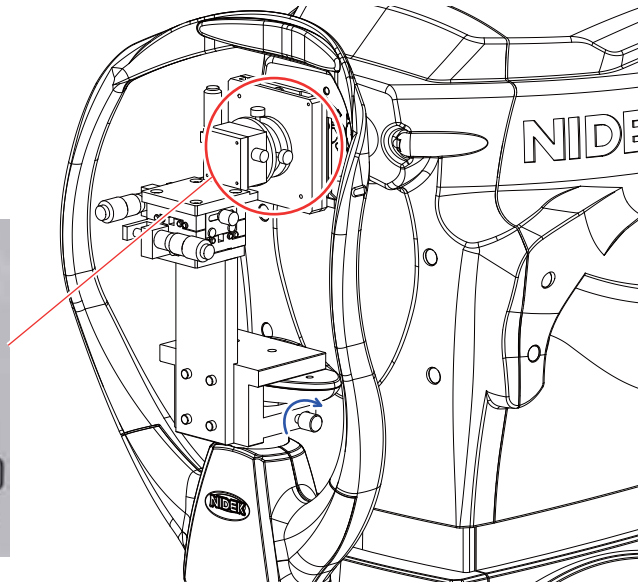
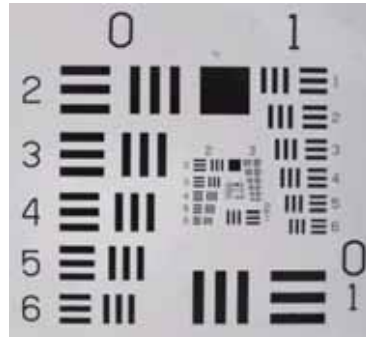
15. Press the  button.



The 1-2. Select Chart screen is displayed.



16. Attach the resolution check jig (15275-1600) (see 8.2.3 [p145]).





17. Press  or  button to select "Manual Set".



18. Press the  button.



The screen for size entry is displayed.

19. Press the  or  button, enter the H size indicated on the resolution check jig (15275-1600).



20. Press the  or  button, enter the W size indicated on the jig.

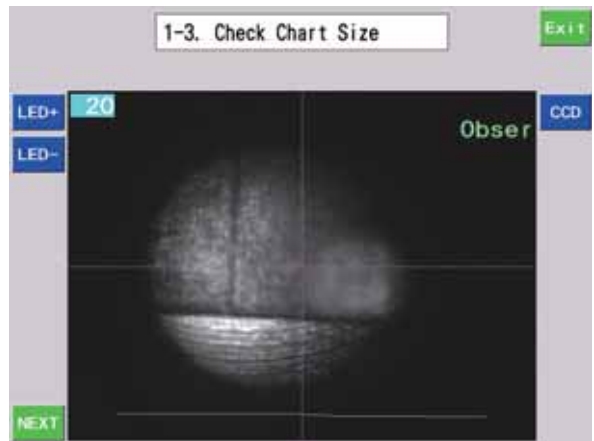


21. Press the **+** or **-** button to enter the W size indicated on the jig..

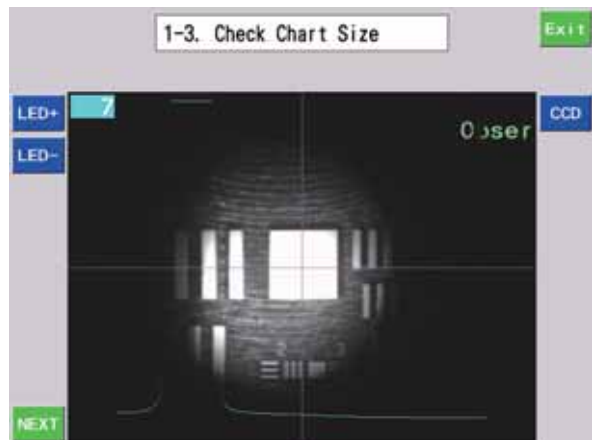
22. Press the **Next** button.




The 1-3. Check Chart Size screen is displayed.

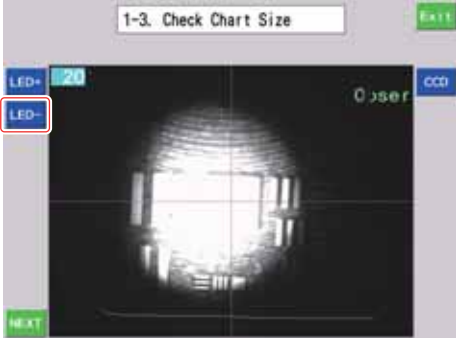
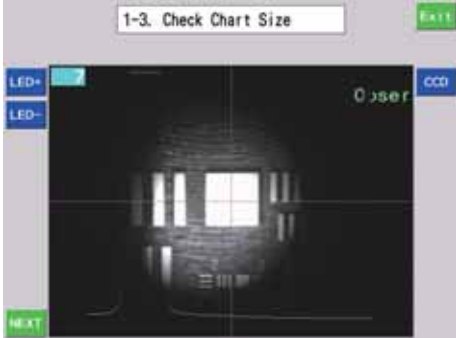


23. Align the capturing unit to the resolution chart with the joystick.

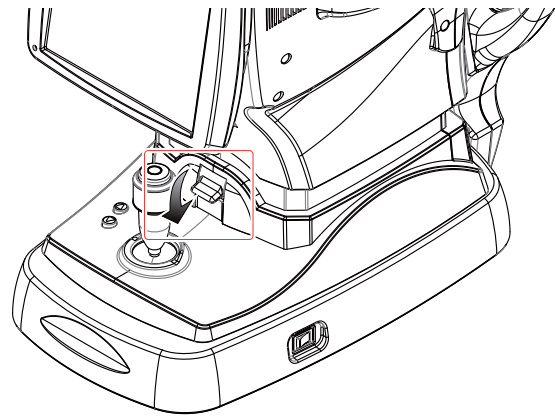


 **Note**

If the resolution chart is difficult to see due to too much light, press the **LED-** button to reduce the light amount.

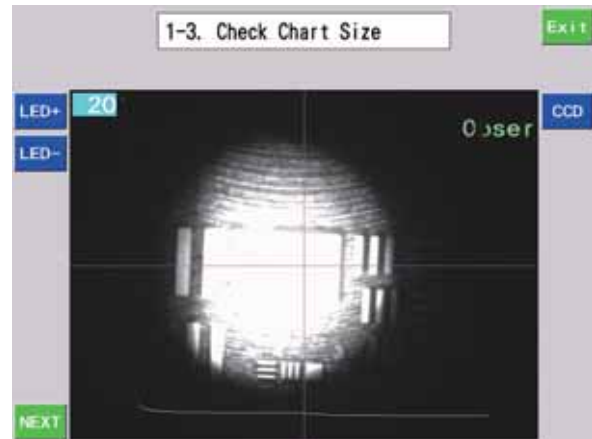

➔


24. When coarse alignment is complete, lower the locking lever.

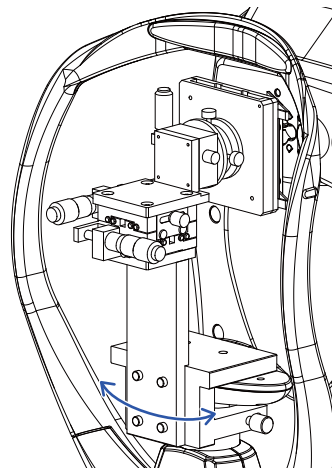


25. Confirm that the resolution check jig (15275-1600) is attached vertically. If the jig is vertical, the received light appears symmetrical.

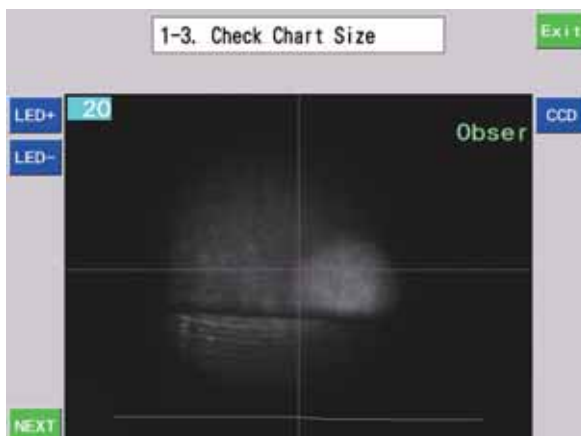
<p>⚠ Caution</p>	<p>If the amount of reflection light is too much and the screen turns completely white, press the</p>
	<p><b>LED-</b> button to reduce the light amount.</p>



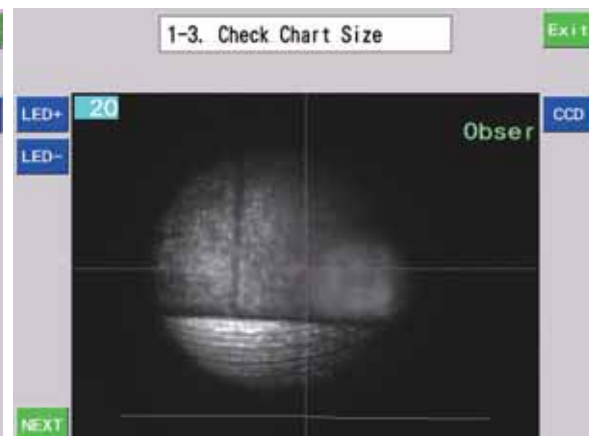
If the jig is tilted, adjust the position of the resolution check jig (15275-1600) so that the received light appears symmetrical.



When tilted to the right

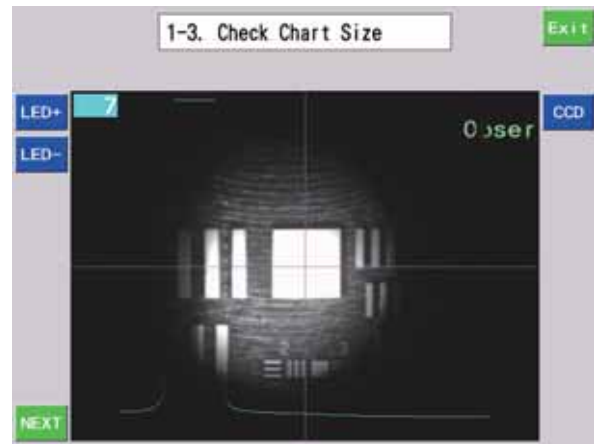


When tilted to the left





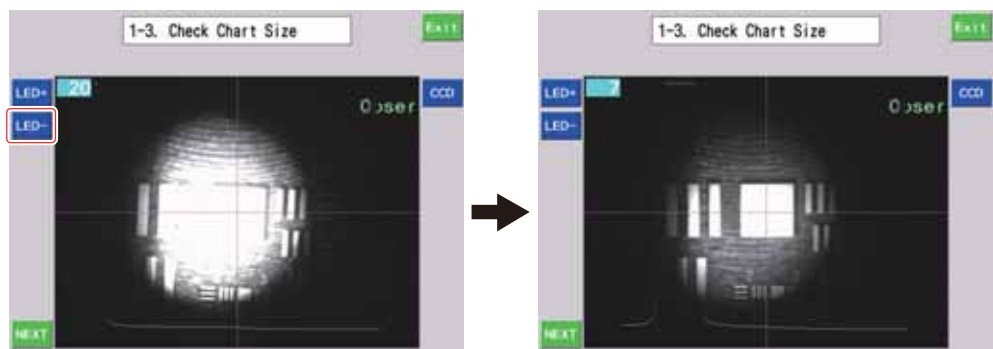
26. Align the capturing unit to the resolution chart with the joystick.



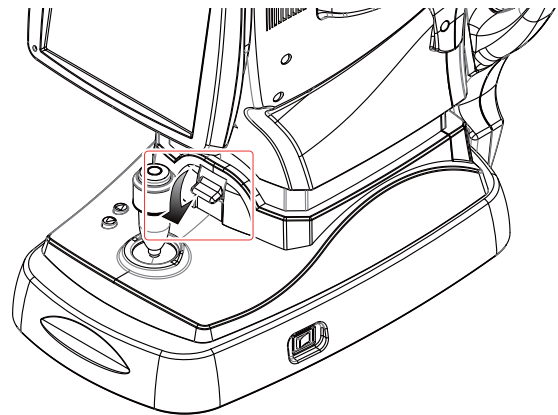
If the resolution chart is difficult to see due to too much light, press the

LED-

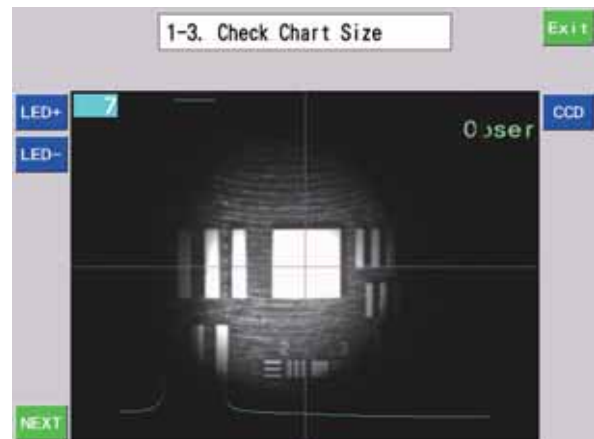
Note



27. When coarse alignment is complete, lower the locking lever.

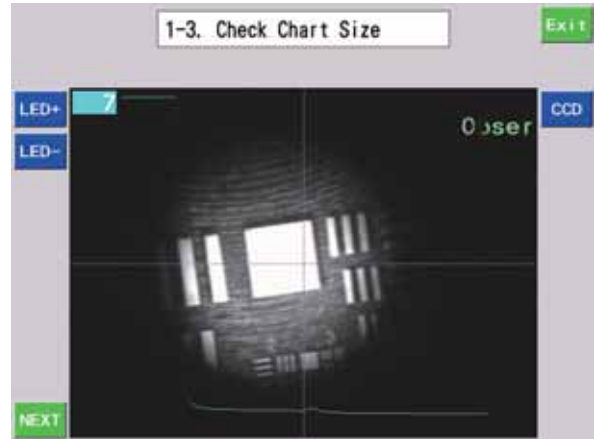
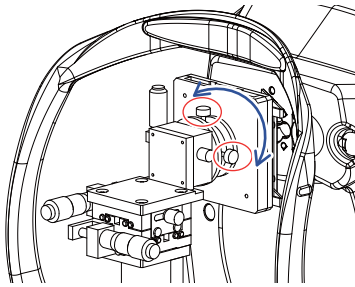


28. Confirm that the resolution chart is parallel to the electric reticle.

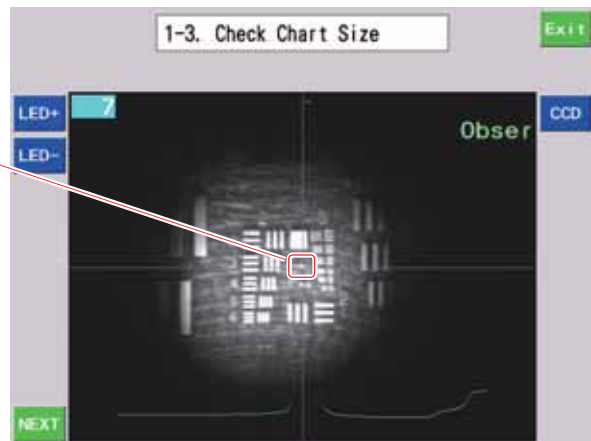
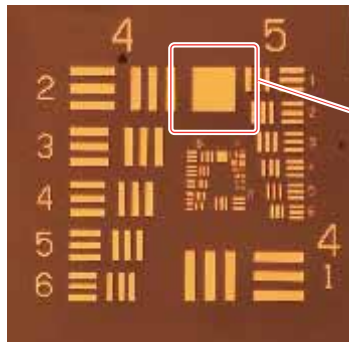




If the resolution chart is tilted, loosen the knurled screw of the jig to adjust the chart to be parallel to the electric reticle.



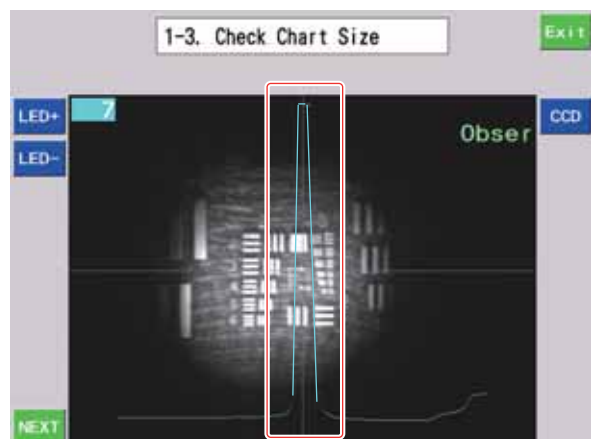
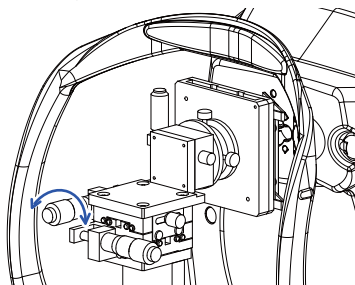
29. Align the square to the lower left of "5" on the resolution chart to the center of the electric reticle.



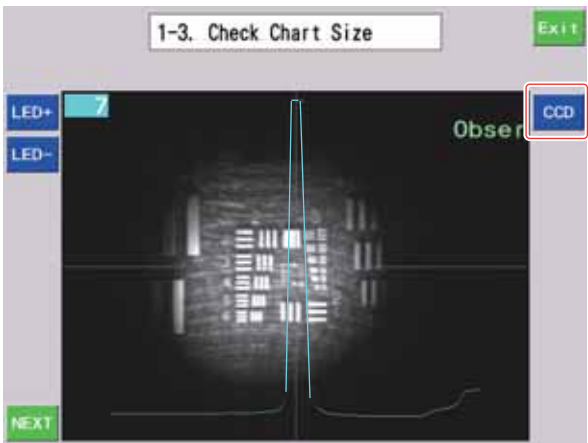
30. Adjust the focus.

With the Z axis micrometer of the jig, move the jig forward and backward.

Align the peak of the CCD signal (light blue line) to the vertical line of the electric reticle (purple line).



31. Press the **CCD** button.

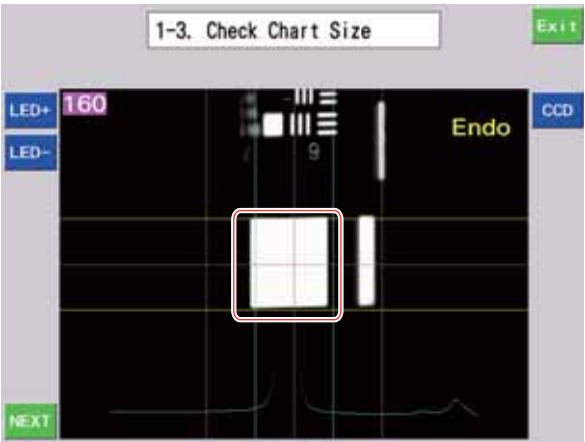



The Endo display appears.



32. With the X, Y, and Z axis micrometers of the jig, move the square chart (0.14 mm × 0.14 mm) in the resolution chart to fit within the range (0.25 mm × 0.55 mm) enclosed with the light blue and yellow lines.

33. Confirm that the square fits within the range above.



 Note If the square does not fit within the range, restart from “1.1 Slit width”.



34. Press the **Next** button.



The 2-1. Check Chart Resolution screen is displayed.

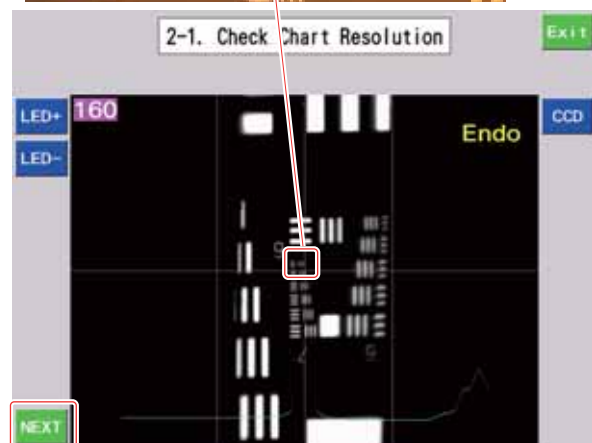


35. With the X, Y, and Z axis micrometers of the jig, move the finest lines (lower right of "9") on the resolution chart to the center of the screen.

36. Confirm that each three vertical and horizontal lines are separately discernible.

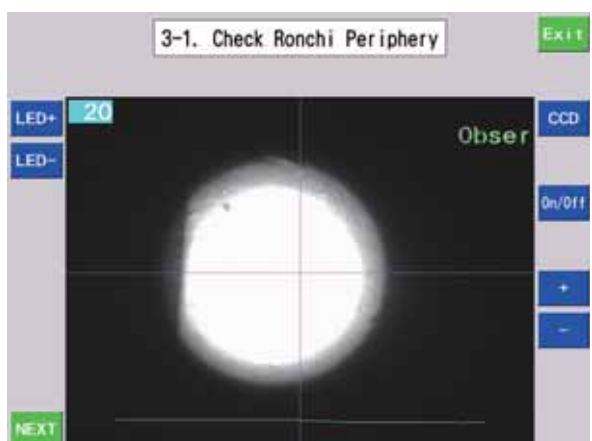
<p>Note</p>	<p>If they are not, press the <b>LED+</b> or <b>LED-</b> button to adjust the light amount.</p>
-------------	-------------------------------------------------------------------------------------------------

If the lines are not separated, the optic axis of the capturing unit may be shifted. Contact NIDEK.

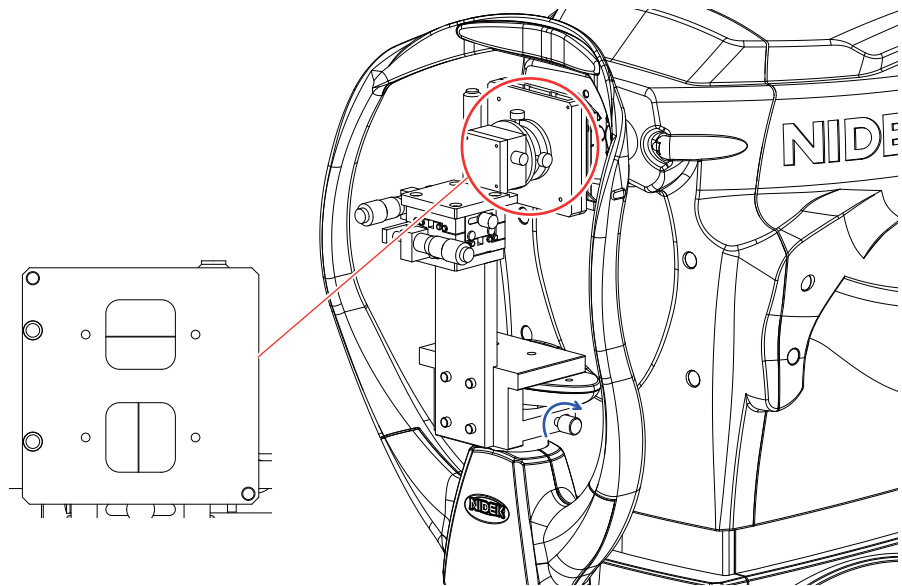


37. Press the **Next** button.

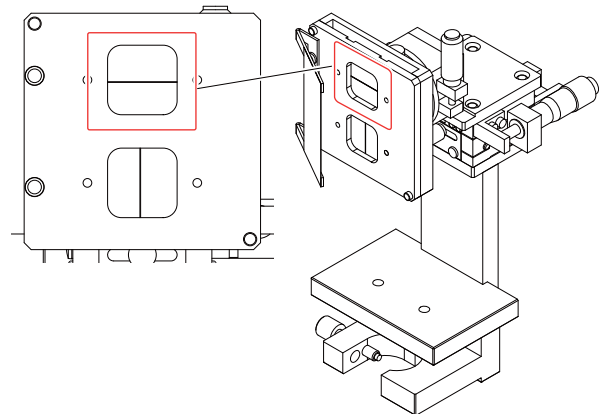
38. The 3-1. Check Ronchi Periphery screen is displayed.



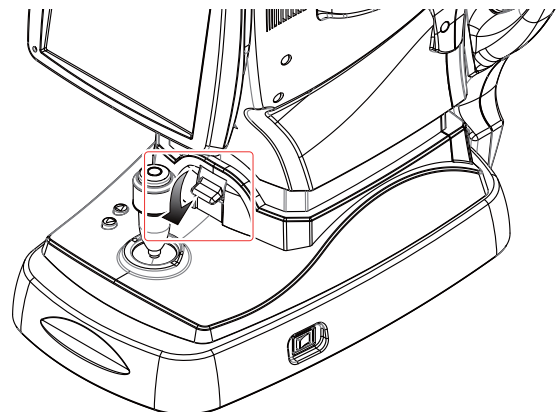
39. Attach the Ronchi-ruling check jig (15275-1700) (see 8.2.4 [p146]).



40. Align the capturing unit to the center of the upper window.

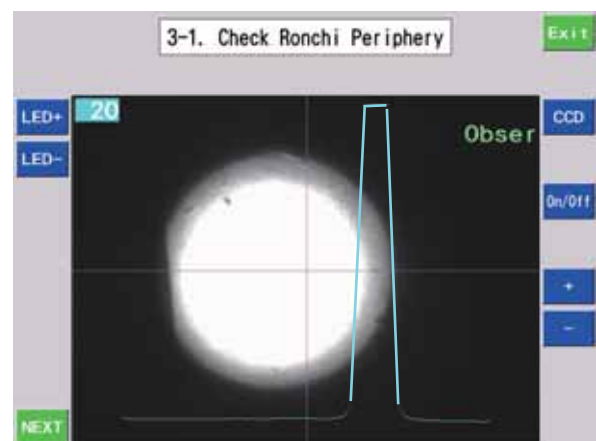


41. When coarse alignment is complete, lower the locking lever.

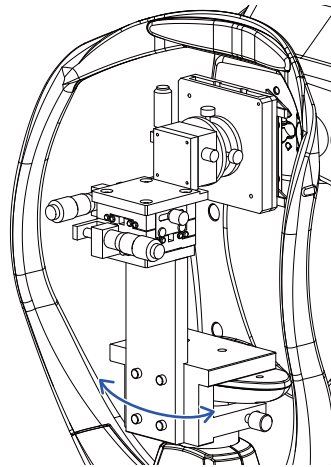


42. Confirm that the Ronchi-ruling check jig (15275-1700) is attached vertically. If the jig is vertical, the received light appears symmetrical.

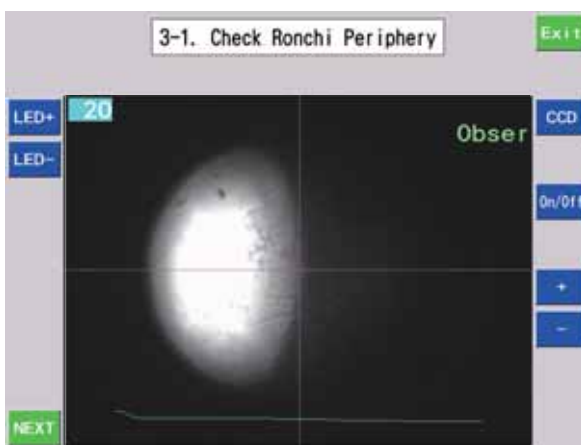
<p>⚠ Caution</p>	<p>If the amount of reflection light is too much and the screen turns completely white, press the <b>LED-</b> button to reduce the light amount.</p>
------------------	------------------------------------------------------------------------------------------------------------------------------------------------------



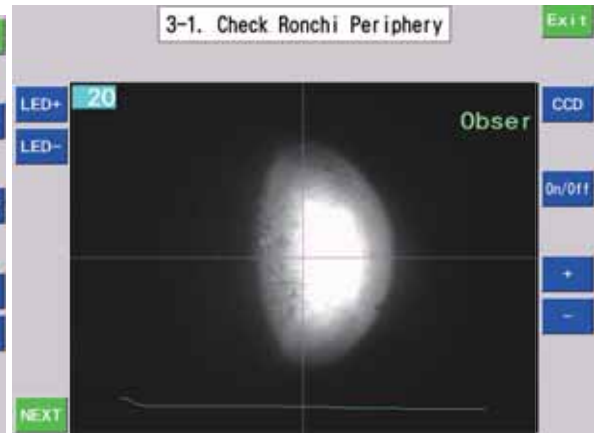
If the jig is tilted, adjust the position of the Ronchi-ruling check jig (15275-1700) so that the received light appears symmetrical.



When tilted to the right

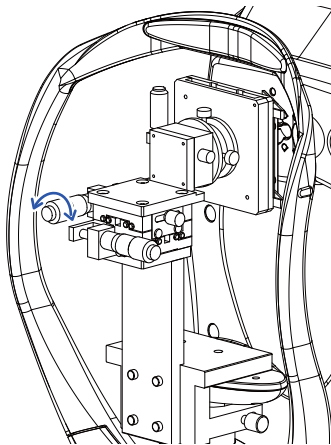


When tilted to the left

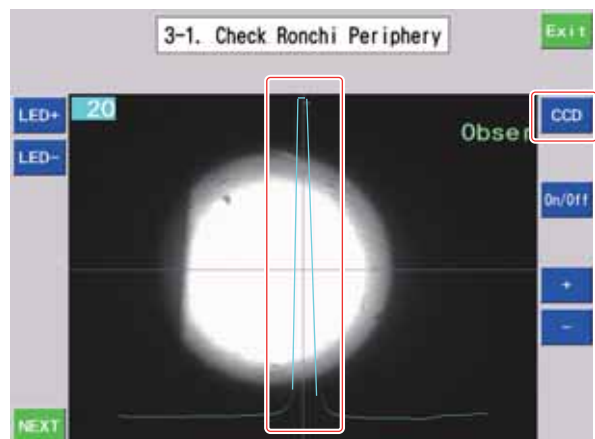


43. Adjust the focus.

- 1 ) With the Z axis micrometer, move the jig forward and backward.
- 2 ) Or, slightly move the joystick forward and backward.



- 3 ) Align the peak of the CCD signal (light blue line) to the vertical line of the electric reticle (purple line).



44. Press the **CCD** button.

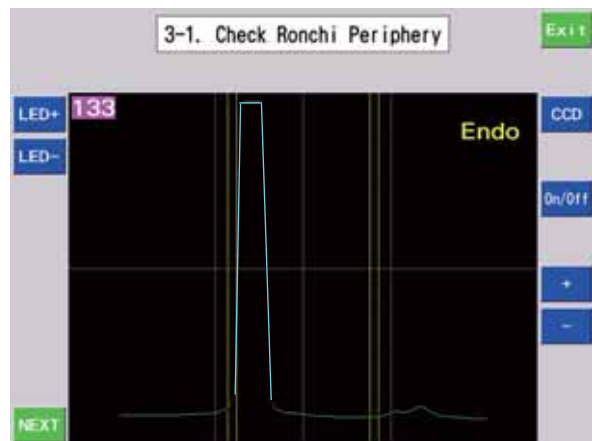
An endothelial image (Endo) captured by the camera is displayed.

45. Confirm that horizontal lines appear as a band.



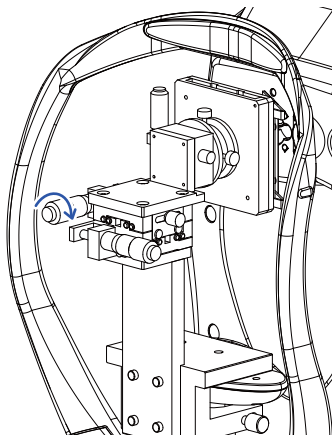
If the screen turns completely black, focus is not proper.

With the Z axis micrometer, align the CCD signal (light blue line) to the vertical line of the electric reticle.



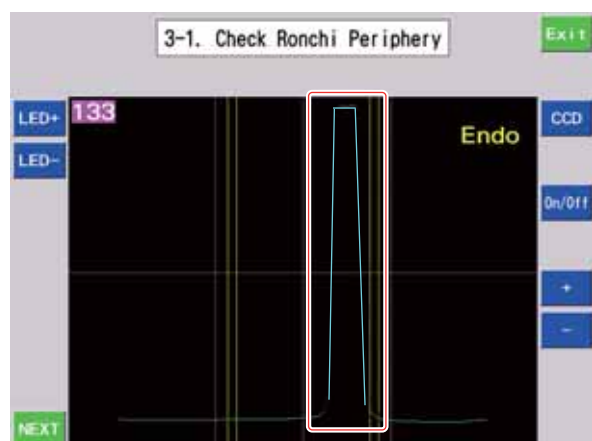
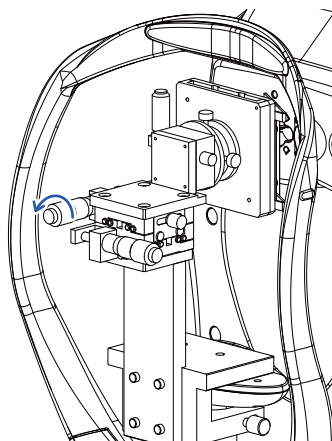
- 1 ) When the peak appears to the left

Turn the Z axis micrometer of the jig counterclockwise.



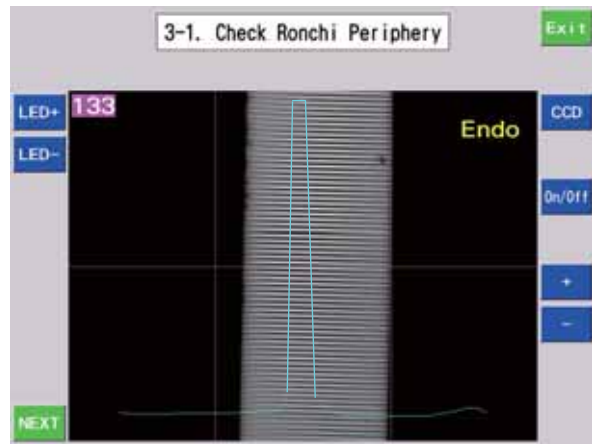
- 2 ) When the peak appears to the right

Turn the Z axis micrometer of the jig clockwise.

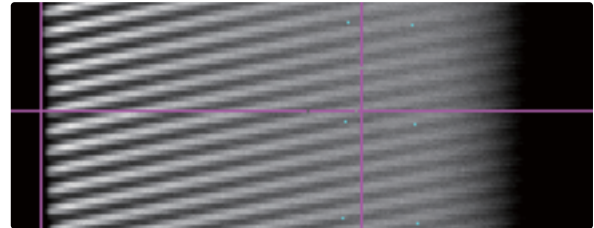
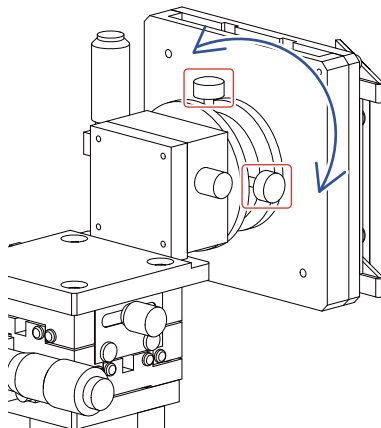




46. Confirm that the horizontal lines of the image are parallel to the horizontal line of the reticle.



- 1 ) If they are tilted, loosen the knurled screw of the jig to adjust the lines to be parallel.



47. Adjust the focus with the Z axis micrometer of the jig so that the both edges of the band fit within the yellow lines on either side.

48. If they do not, press the **+** or **-** button to adjust the positions of the yellow lines.
49. Confirm that the horizontal lines near both edges of the band are separately discernible.



Note

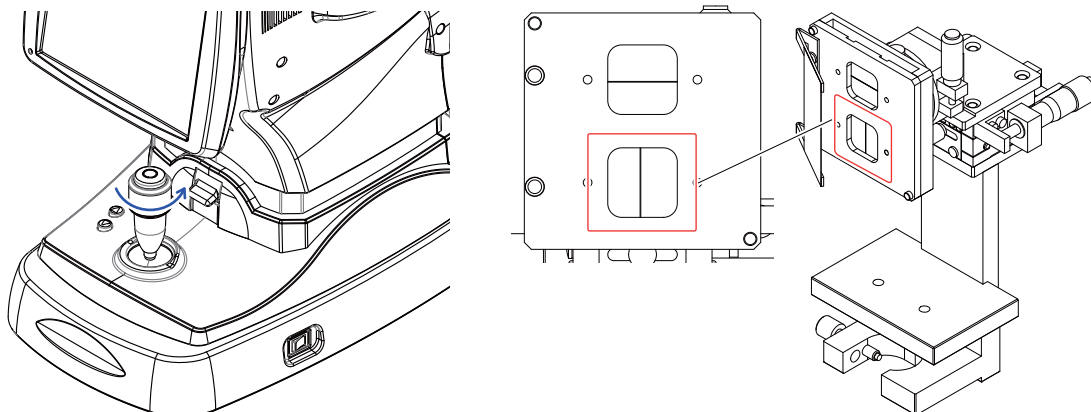
If the yellow lines impair the vision, press the **ON/OFF** button to turn off the yellow lines. If the brightness of the image is improper, press the **LED+** or **LED-** button to adjust the light amount.



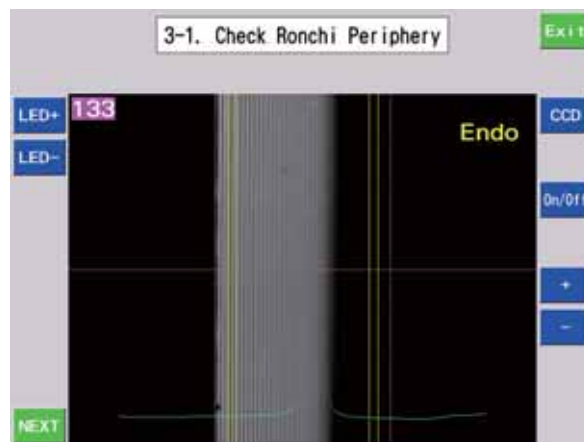
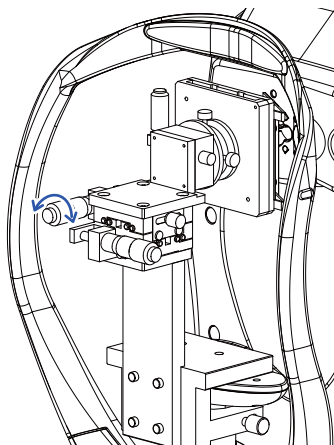
Caution

If the horizontal lines are not separated, the optic axis of the capturing unit may be shifted. Contact NIDEK.

50. Turn the joystick knob counterclockwise to align the capturing unit to the lower window of the jig.



51. With the Z axis micrometer of the jig, adjust the focus.

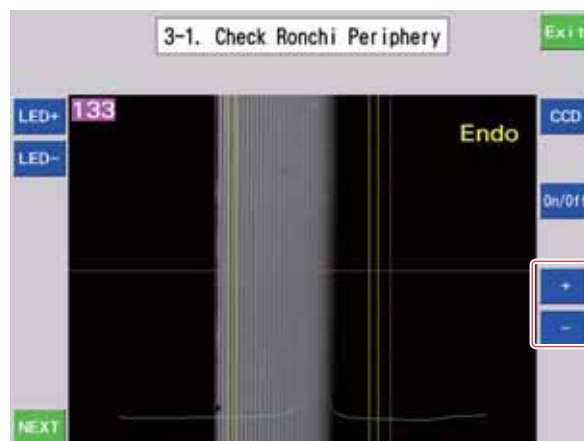


52. Confirm that the vertical lines appear as a band.

53. Adjust the focus with the Z axis micrometer of the jig so that both edges of the band fit within the yellow lines.

54. If they do not, press the **+** or **-** button to adjust the positions of the yellow lines.

55. Confirm that the vertical lines near both edges of the band are separately discernible.

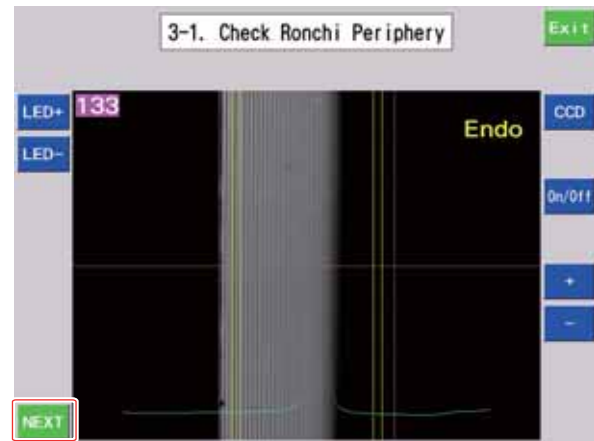


Note	If the yellow lines impair the vision, press the <b>ON/OFF</b> button to turn off the yellow lines. If the brightness of the image is improper, press the <b>LED+</b> or <b>LED-</b> button to adjust the light amount.
------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Caution	If the vertical lines are not separated, the optic axis of the capturing unit may be shifted. Contact NIDEK.
---------	-----------------------------------------------------------------------------------------------------------------

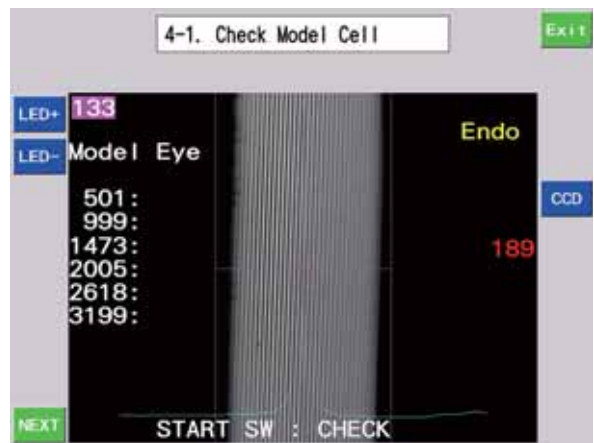


56. Press the **Next** button.



The 4-1. Check Model Cell screen is displayed.

Continuously, perform the procedure as in “8.3.12.2 Check cell density (p196)”.



### 8.3.12.2 Check cell density

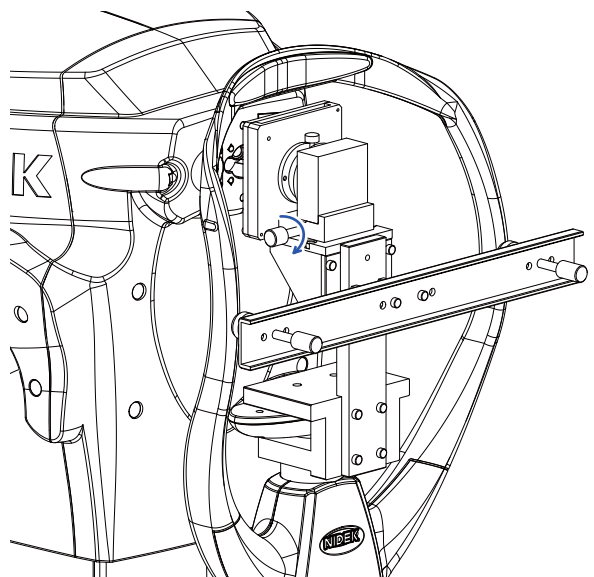
- 1 . Activate Maker mode (see 8.1 [p137]).
- 2 . Press the **Inspection** button.

3 . The Inspection screen is displayed.

- 4 . Press the **4. Check Cell Density** button.

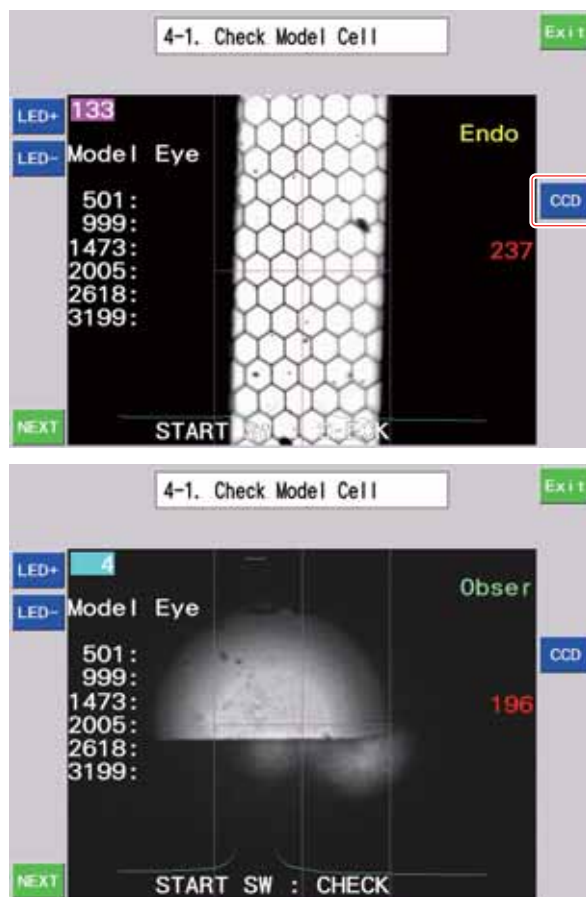
The 4-1. Check Model Cell screen is displayed.

- 5 . Attach the cell model eye jig (15275-2100) (see 8.2.5 [p147]).

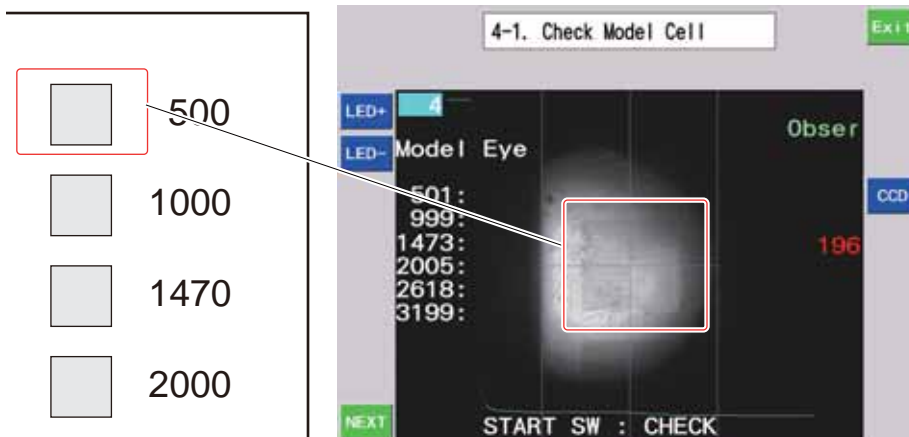


6 . Press the **CCD** button.

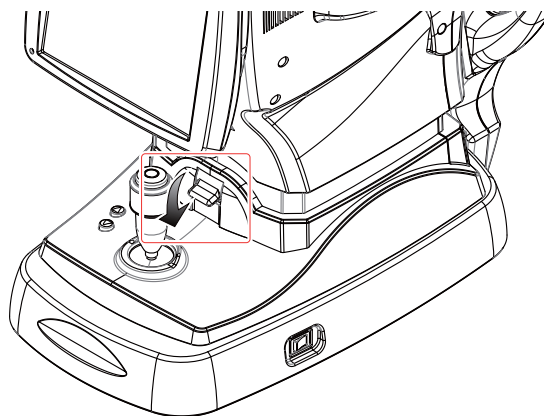
The anterior segment camera (Obser) screen is displayed.



7 . Align the capturing unit to the 500 cell (per mm<sup>2</sup>) model eye.



8 . When coarse alignment is complete, lower the locking lever.



- 9 . Confirm that the cell model eye jig (15275-2100) is attached vertically.

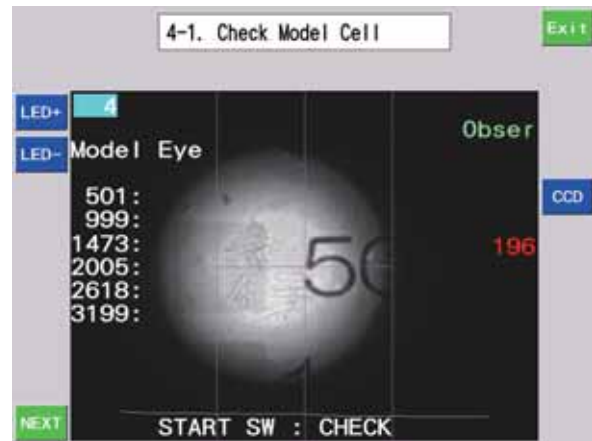
If the jig is vertical, the received light appears symmetrical.

⚠ Caution

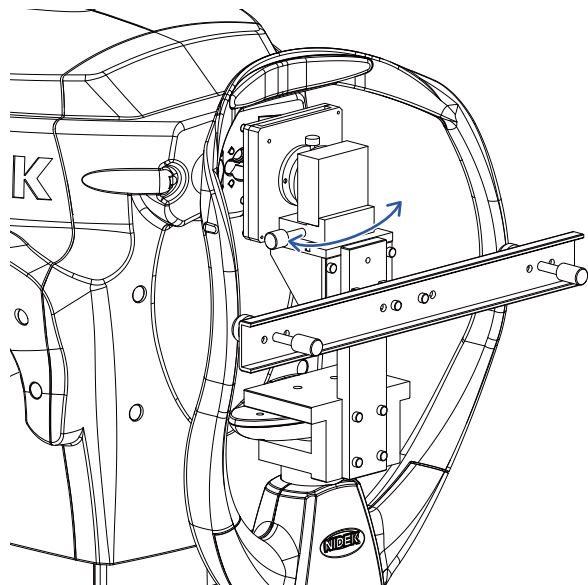
If the amount of reflection light is too much and the screen turns completely white, press the

**LED-**

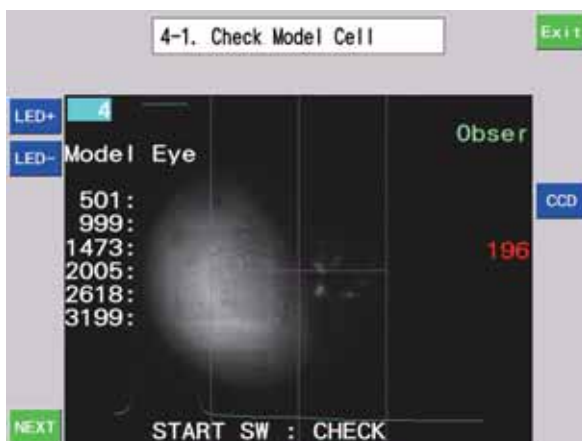
button to reduce the light amount.



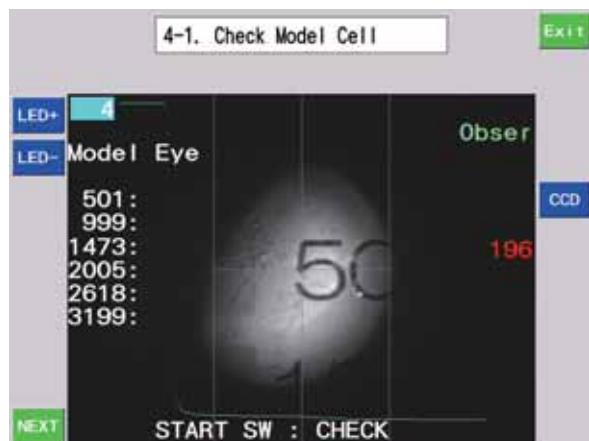
If the jig is tilted, adjust the position of the cell model eye jig (15275-2100) so that the received light appears symmetrical.



When tilted to the right



When tilted to the left

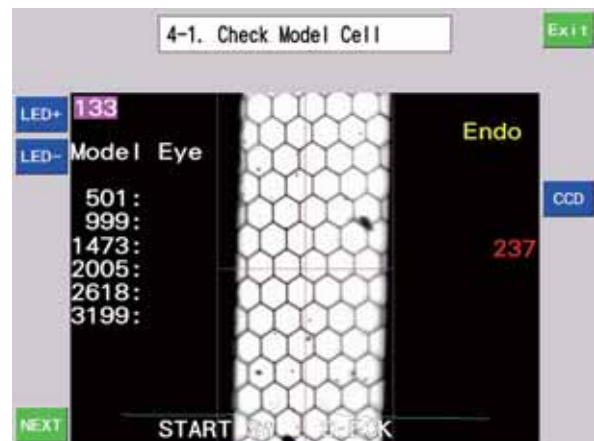
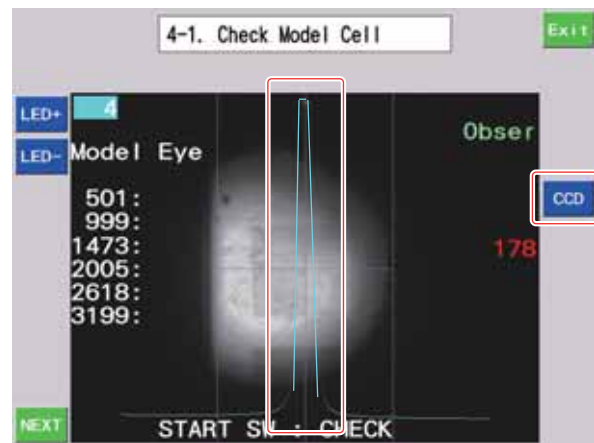


## 10. Adjust the focus.

- 1 ) Slightly move the joystick forward and backward.
- 2 ) Align the peak of the CCD signal (light blue line) to the vertical line (purple line) of the electric reticle.

11. Press the **CCD** button.

The 500 cell (per mm<sup>2</sup>) model eye is displayed.



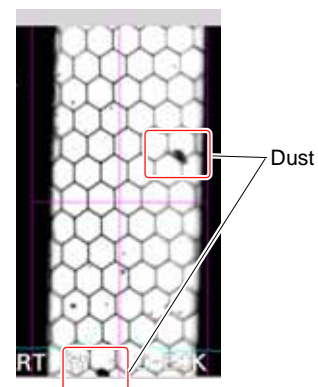
## ⚠ Caution

If the screen turns completely black, focus is not proper.

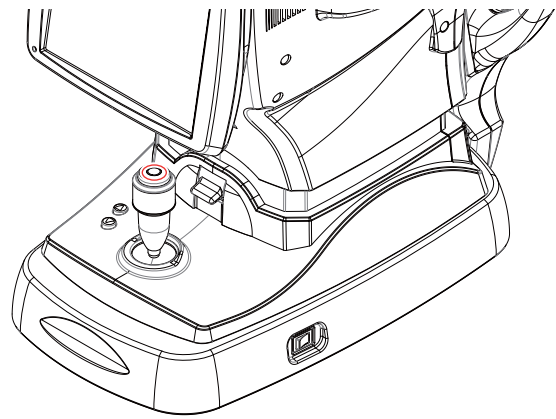
Adjust the focus so that the CCD signal (light blue line) aligns to the vertical line of the electric reticle.

If there is any dust on the cell model eye, measurement cannot be performed properly.

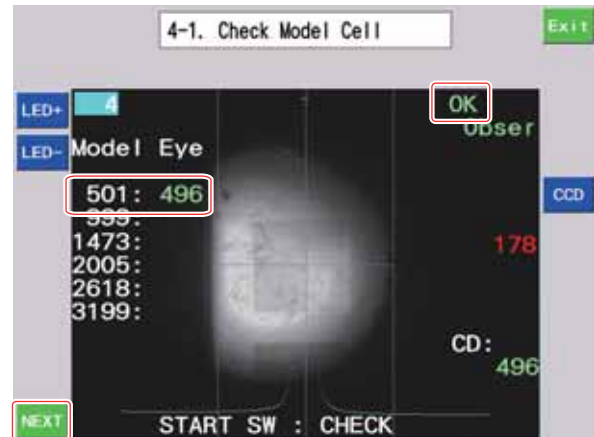
If there is any dust, clean the model eye with a blower. Also, move the capturing unit up and down to find a location without any dust.



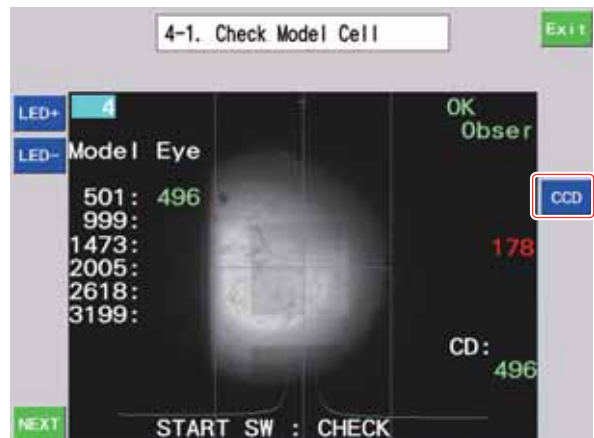
12. Press the start button of the joystick.  
 A beep sounds and measurement starts.  
 START (displayed in yellow)  
 Short beeps sound.  
 LED OK (displayed in blue)  
 Long beeps sound.



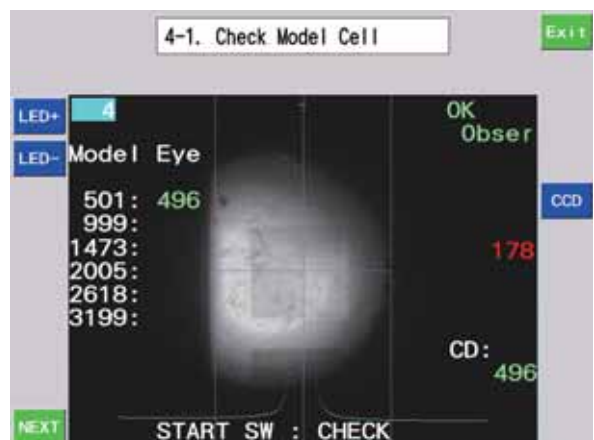
After measurement, the measurement result is displayed.  
 If "OK" (in green) appears, there is no problem.  
 If "ERROR" (in red) appears, perform calibration (see 8.4.2 [p214]).



13. Press the **CCD** button.  
 The anterior segment camera (Obser) screen is displayed.



14. Turn the joystick knob counterclockwise to align the capturing unit to the 1000 cell (per mm<sup>2</sup>) model eye just below.





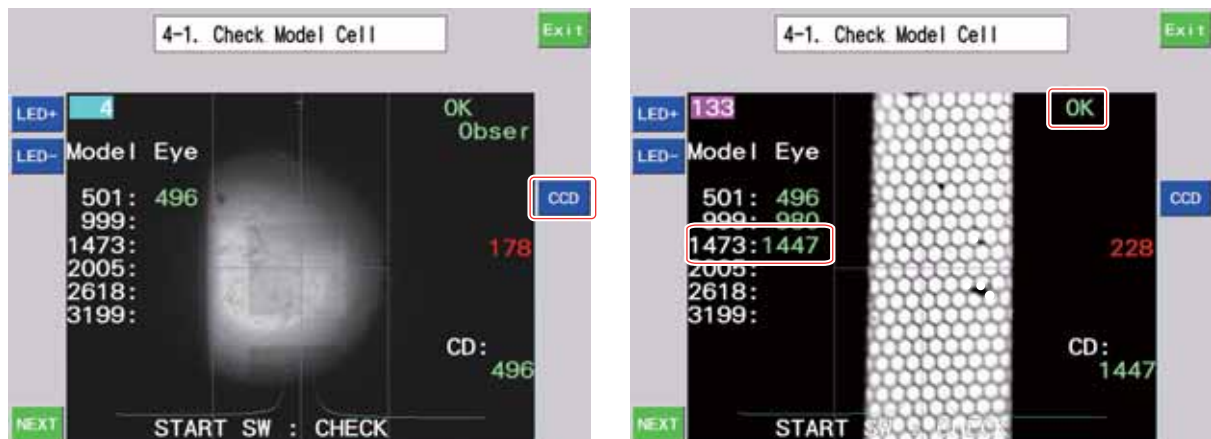
15. Measure the 1000 cell (per mm<sup>2</sup>) model eye the same as the 500 cell (per mm<sup>2</sup>) model eye.



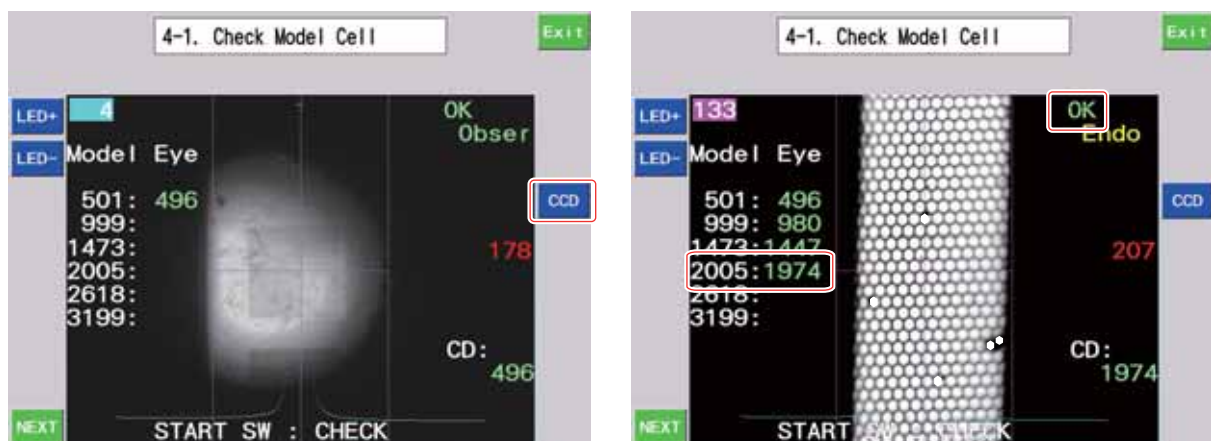
16. Measure the 1470, 2000, 2600, and 3200 cell model eyes in the same manner.

<p>⚠ Caution</p>	<p>As the cell size becomes smaller, high accuracy of focus is required. Adjust the focus so that the band fits within the purple lines on either side and both edges of the band are in proper focus.</p>
------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

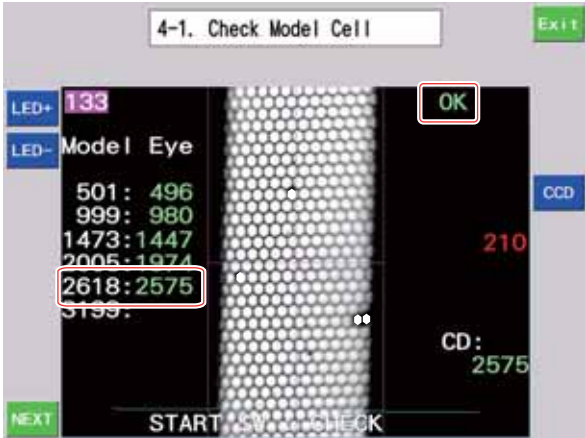
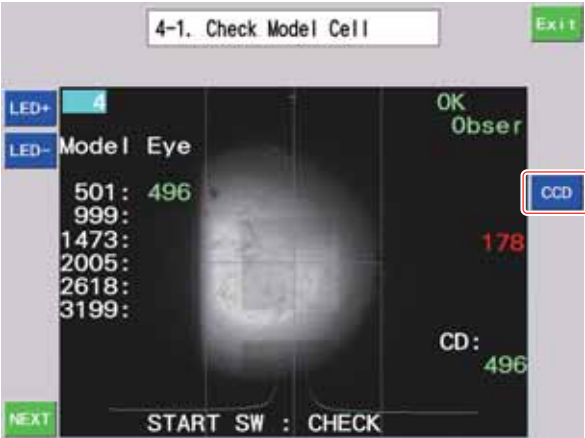
1470 cell (per mm<sup>2</sup>) model eye



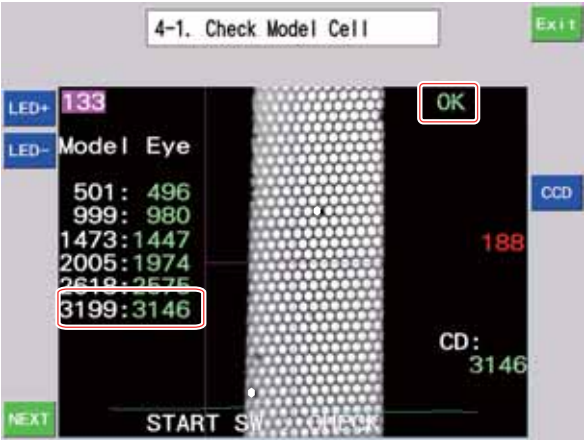
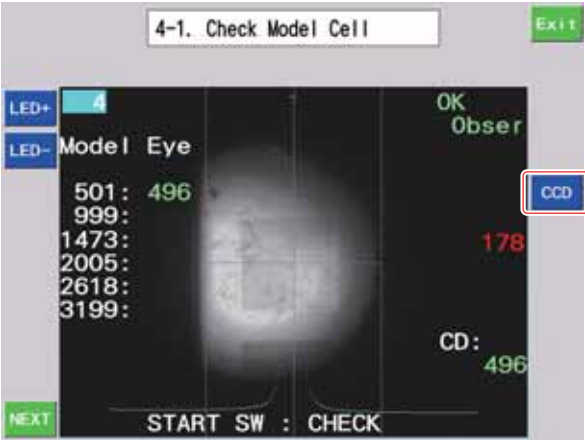
2000 cell (per mm<sup>2</sup>) model eye



2600 cell (per mm<sup>2</sup>) model eye



3200 cell (per mm<sup>2</sup>) model eye



If "OK" (in green) appears in each measurement, measured values are printed.

--- CELL DENSITY ---  
500 : OK  
994 : OK  
1465 : OK  
1985 : OK  
2620 : OK  
3216 : OK

If "ERROR" (in red) appears, perform the endothelium measurement calibration (see 8.4.2 [p214]).

17. Press the **Exit** button.



The Inspection screen is displayed.

18. Press the **Print Cut** button to cut the paper on which the result is printed.

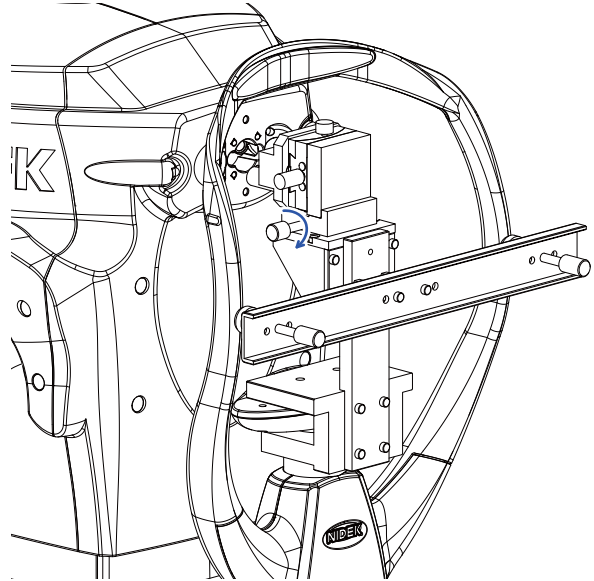




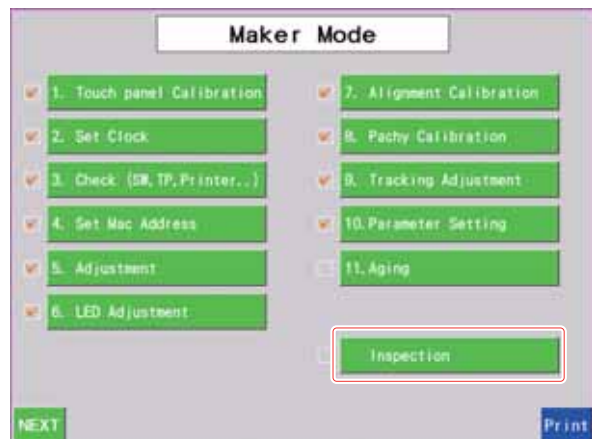
### 8.3.13 Pachymetry accuracy check

Task	Symptom
Check the pachymetry accuracy.	5.8.7 Endothelium measurement data is not within normal range (p46)

- 1 . Attach the calibration jig (15275-1400)  
(see 8.2.2 [p144]).
  - \* The calibration jig (15275-1400) is dedicated to pachymetry calibration.



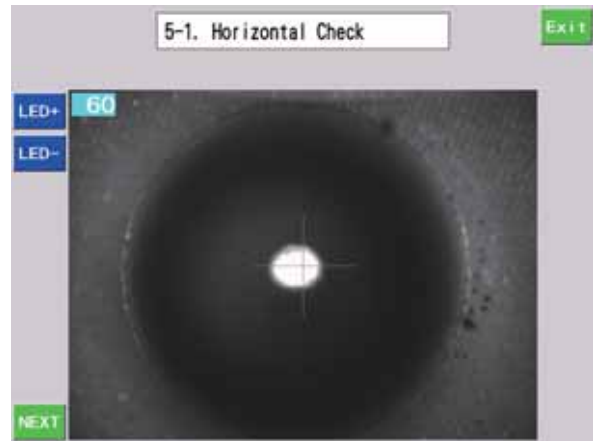
- 2 . Activate Maker mode (see 8.1 [p137]).
- 3 . Press the **Inspection** button.




- 4 . The Inspection screen is displayed.
- 5 . Press the **5. Check Pachy** button.



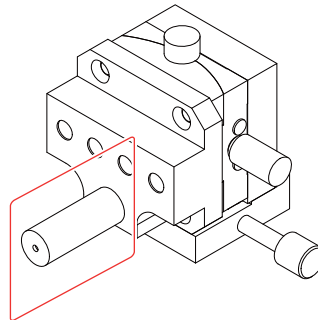
The 5-1. Horizontal Check screen is displayed.



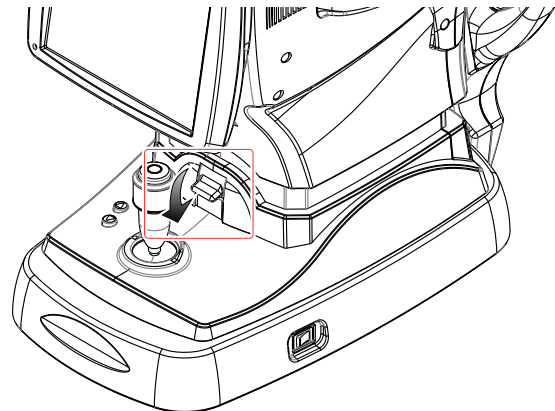
6 . Align the calibration jig (15275-1400).

 <b>Caution</b>	If the jig is not attached vertically, pachymetry cannot be performed properly.
--------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------


Align the capturing unit to the enclosed area of the jig as shown to the right.

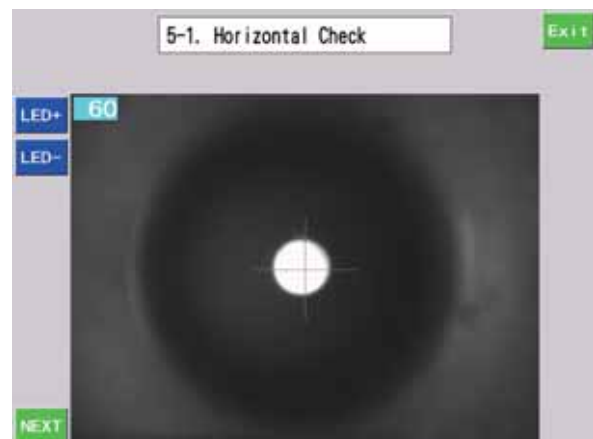


7 . When coarse alignment is complete, lower the locking lever.



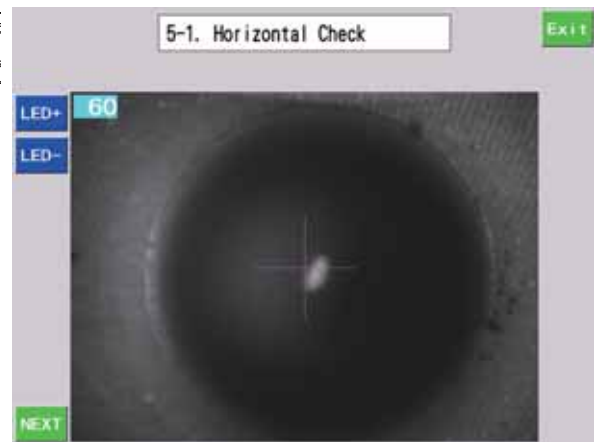
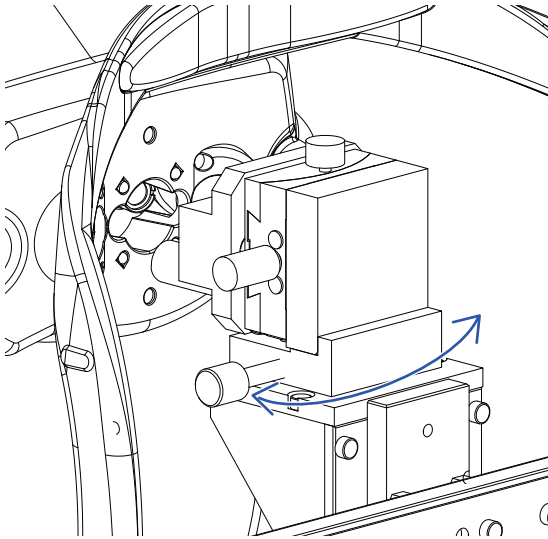
8 . Confirm that the jig is attached vertically. If the jig is vertical, the received light appears a perfect circle.

 <b>Caution</b>	<p>If the amount of reflection light is too much and the screen turns completely white, press the</p> <p><b>LED-</b> button to reduce the light amount.</p>
----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------

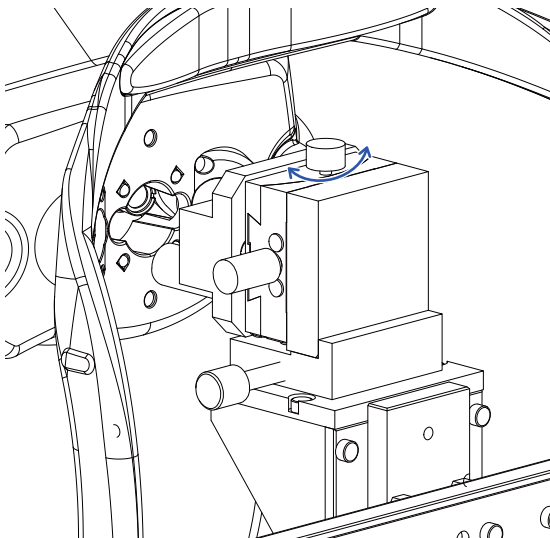


If the jig is tilted, adjust the position of the calibration jig (15275-1400) so that a perfect circle appears in the center.

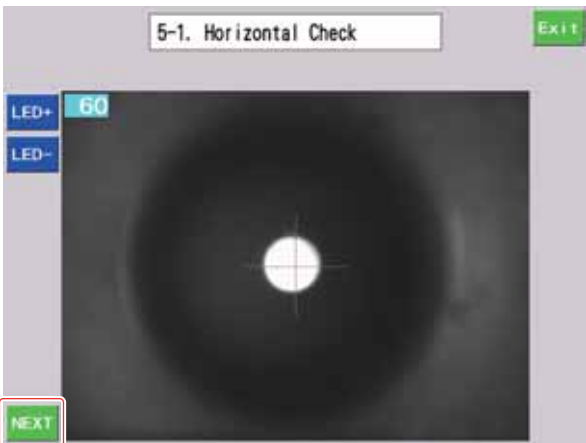
1 ) When tilted to the right or left



2 ) When shifted up or down



9 . Press the **Next** button.

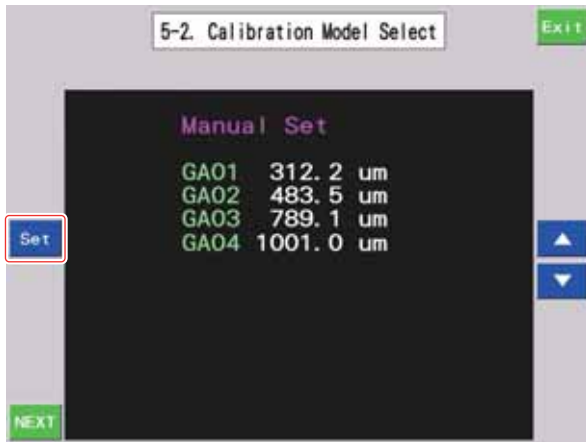


The 5-2. Calibration Model Select screen is displayed.

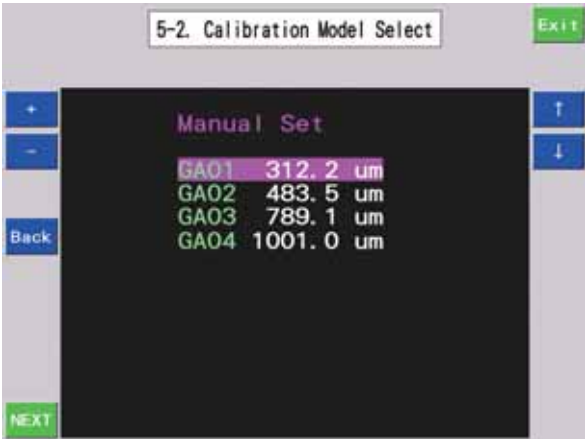
10. Press the  or  button to select “Manual Set”.





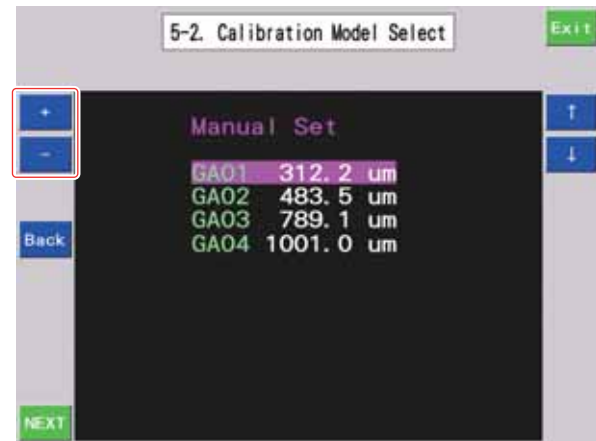
11. Press the **Set** button.





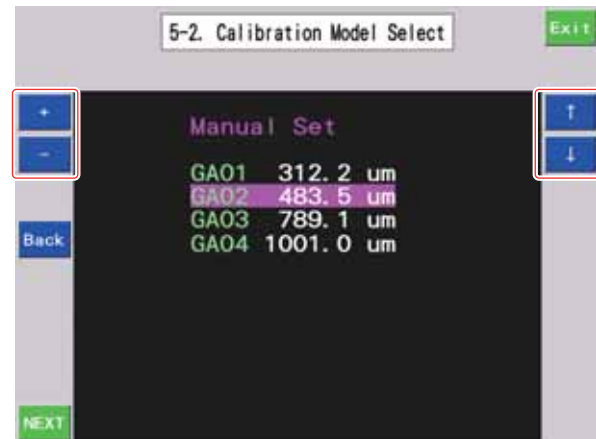
12. The Manual Set entry screen is displayed.



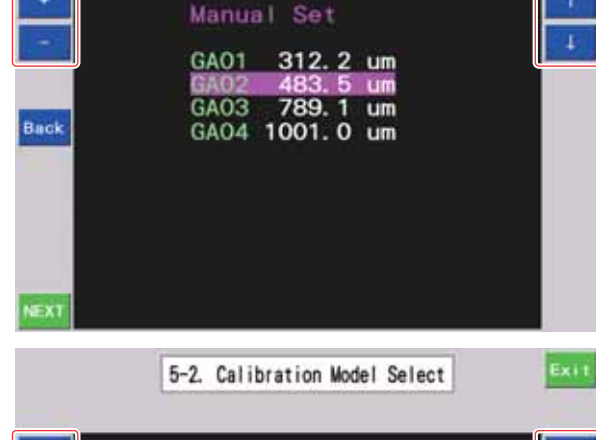
13. Press the  or  button to enter the GA01 size indicated on the jig.



14. Press the  or  button to select "GA02".



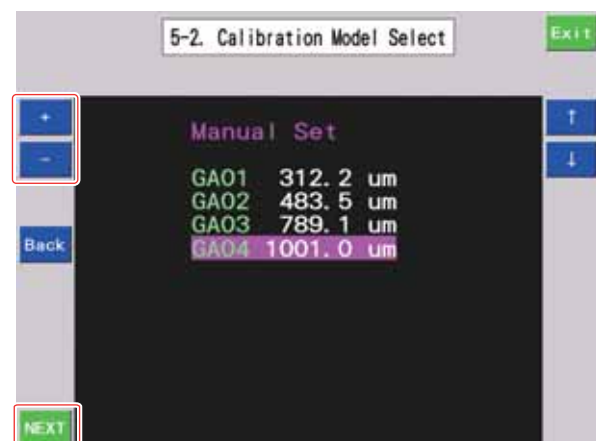
15. Press the  or  button to enter the GA02 size indicated on the jig.



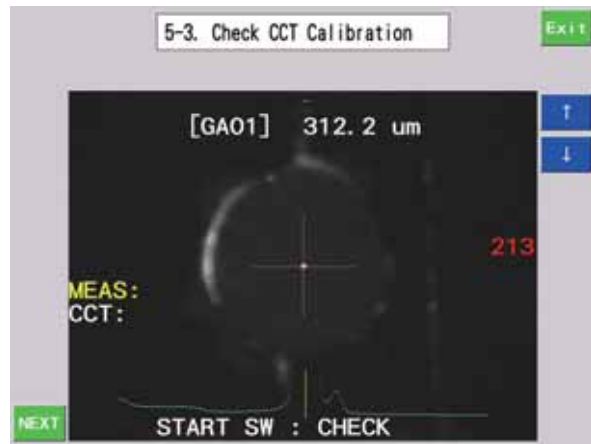
16. Enter the GA03 and GA04 sizes the same as above.



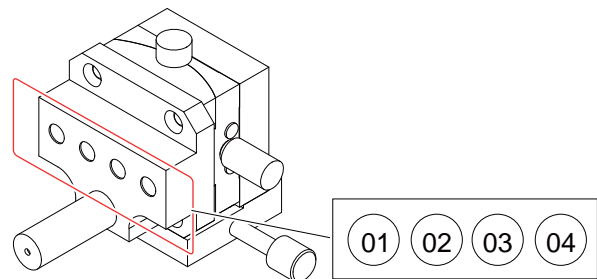
17. Press the  button.



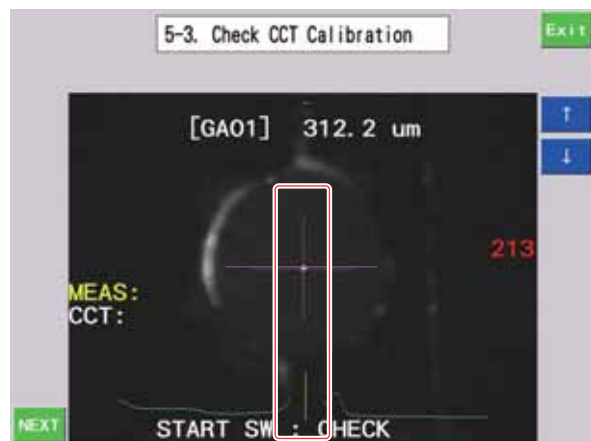
The 5-3. Check CCT Calibration screen is displayed.



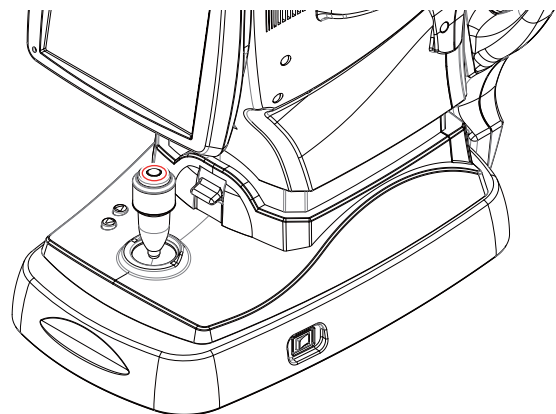
18. Align the capturing unit to GA01 of the calibration jig (15275-1400) with the joystick. Align the center of the electric reticle to that of GA01.



19. Adjust the focus.  
Move the capturing unit forward and backward so that the yellow vertical line on the CCD waveform (light blue line) aligns to the vertical line of the electric reticle.



20. Press the start button of the joystick.  
A beep sounds.



After measurement, a beep sounds and “OK” or “ERR” appears.

Three short beeps sound (OK).

Two short beeps sound (ERROR).



21. After measurement, confirm that “OK” appears to the right of “MEAS” and a measured value to the right of “CCT”.
22. Press the start button of the joystick and perform two measurements (totally three measurements).

If “ERR” does not appear, the display switches from [GA01] to [GA02].

If “ERR” appears, perform pachymetry calibration (see 8.4.3 [p222]).

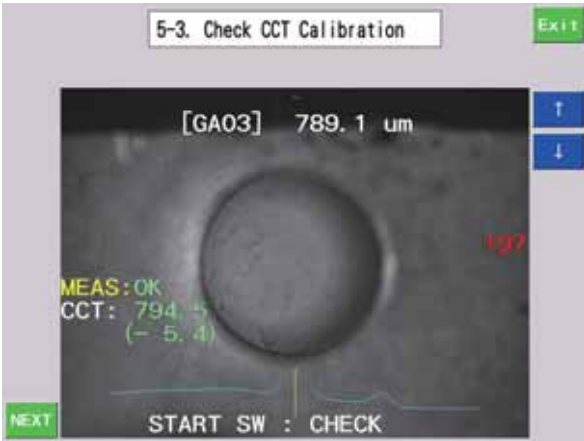


23. Align the capturing unit to GA02.
24. Measure GA02 three times.

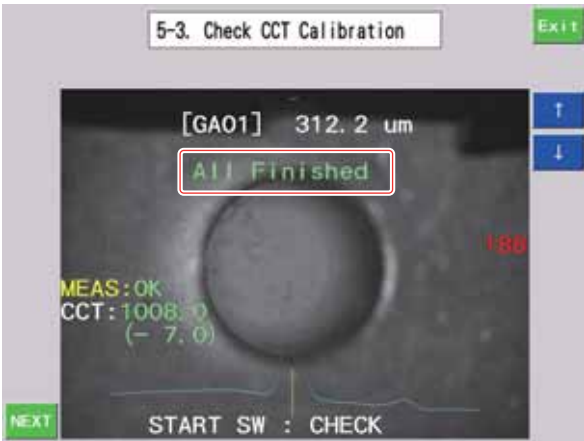




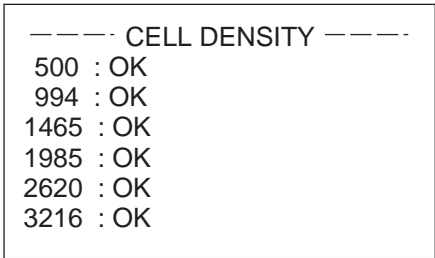
25. For GA03 and GA04, perform the same procedure as above.



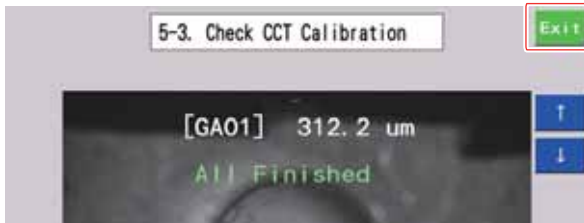
When all measurements are complete, “All Finished” appears on the screen.



The measured values are printed.  
If “ERR” appears, perform pachymetry calibration (see 8.4.3 [p222]).



26. Press the **Exit** button.



The Inspection screen is displayed.

27. Press the **Print Cut** button to cut the paper on which the result is printed.



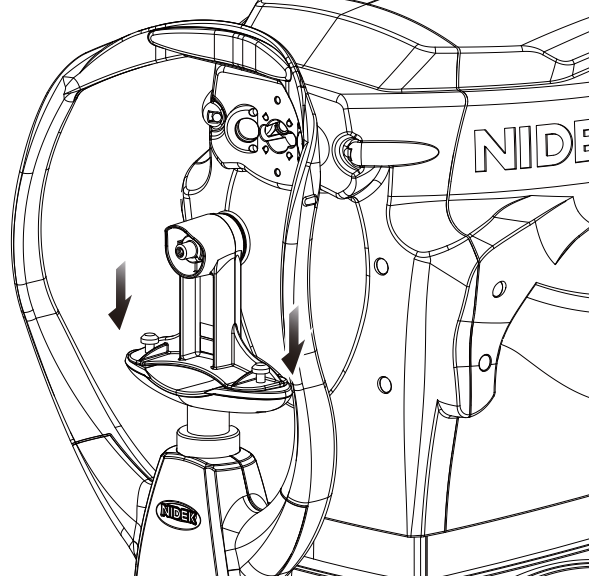


## 8.4 Adjustment

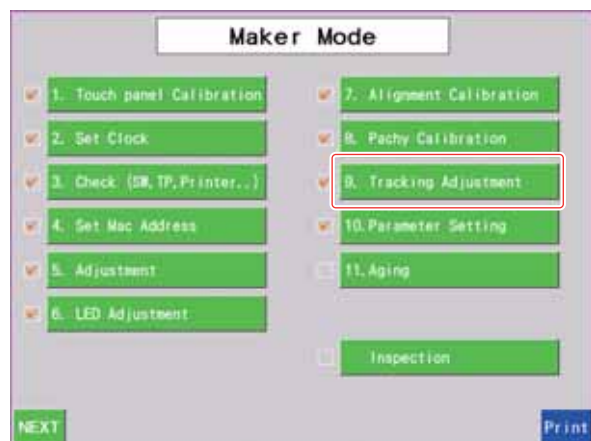
### 8.4.1 Tracking adjustment

Task	Symptom
Precisely adjust the tracking function.	5.8.3 Auto alignment does not function (p41)

- 1 . Attach the model eye (CL) unit (32961-0500).



- 2 . Activate Maker mode (see 8.1 [p137]).
- 3 . Press the **9. Tracking adjustment** button.



The 9. Tracking Adjustment screen is displayed.



- 4 . Align the capturing unit to the center of the model eye.

When the model eye is almost aligned, the auto tracking function is activated and performs fine alignment.



The electric reticle turns yellow.



- 5 . Confirm with the joystick that auto tracking functions properly.

If overshoot occurs five times or more, reduce the value.

If the response is slow and auto tracking does not function, increase the value.



- 6 . If auto tracking in the up direction is not proper

- 1 ) Press the  or  button to select the parameter for the upward movement.

Press the  or  button to change the parameter value.

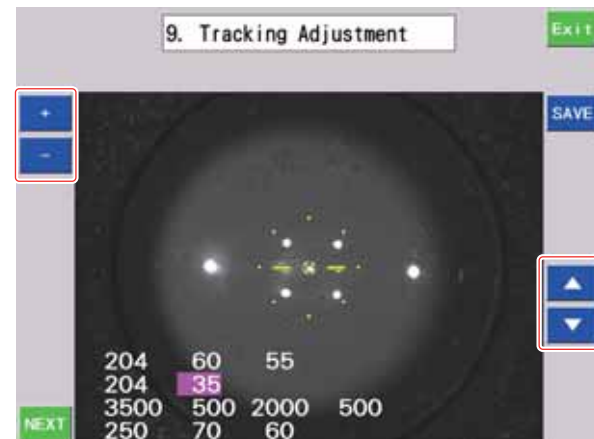
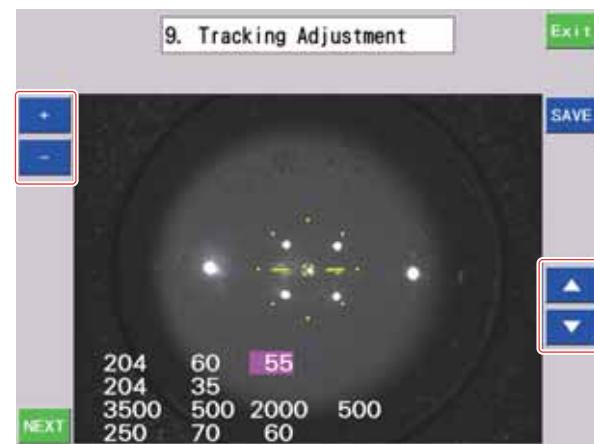
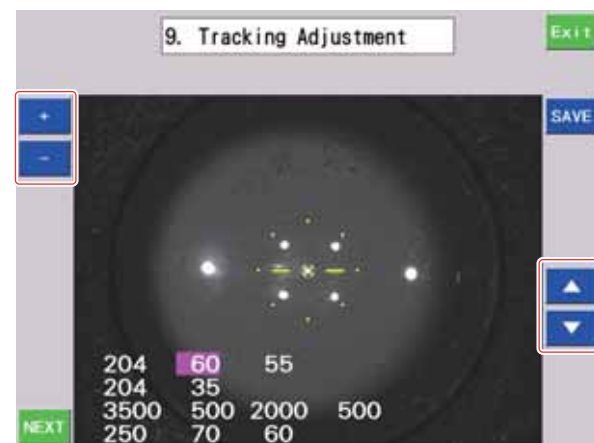
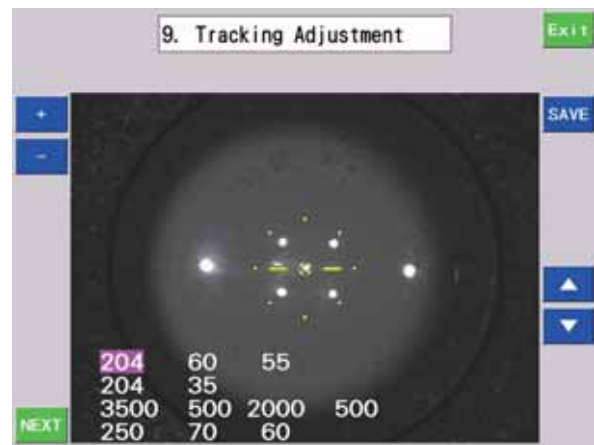
- 7 . If auto tracking in the down direction is not proper

- 1 ) Select the parameter for the downward movement.

Press the  or  button to change the parameter value.

- 8 . If auto tracking in the right/left direction is not proper

- 1 ) Select the parameter for the right/left movement.



9 . Press the **Exit** button.




10. The Maker Mode screen is displayed again.

11. Perform the procedure as in “8.3.8 Tracking check” (p162).

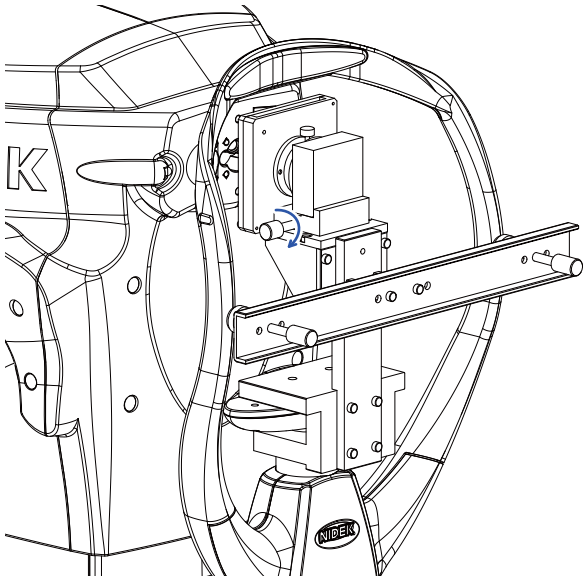
8.4.2 Endo image calibration

Task	Symptom
Calibrate the endothelium measurement.	5.8.7 Endothelium measurement data is not within normal range (p46)

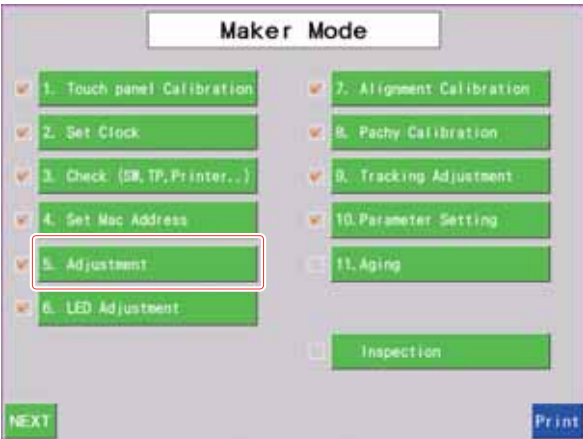
 Caution

If the jig is not clean, proper calibration cannot be performed.  
Confirm that the jig is clear in advance.  
Even indiscernible dirt may affect calibration accuracy.  
Perform the task here carefully.

- 1 . Attach the cell model eye jig (15275-2100)  
(see 8.2.5 [p147]).



- 2 . Activate Maker mode (see 8.1 [p137]).
- 3 . Press the 5. Adjustment button.



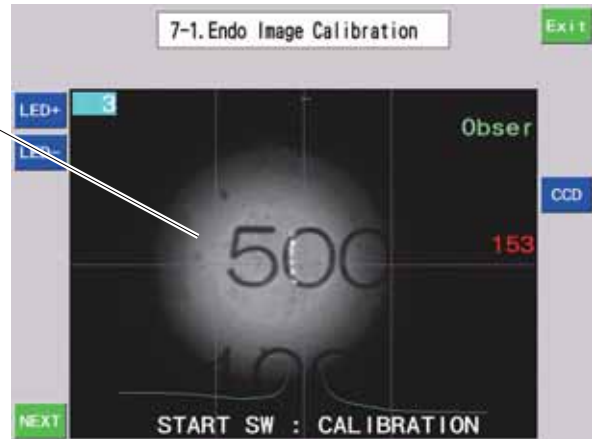
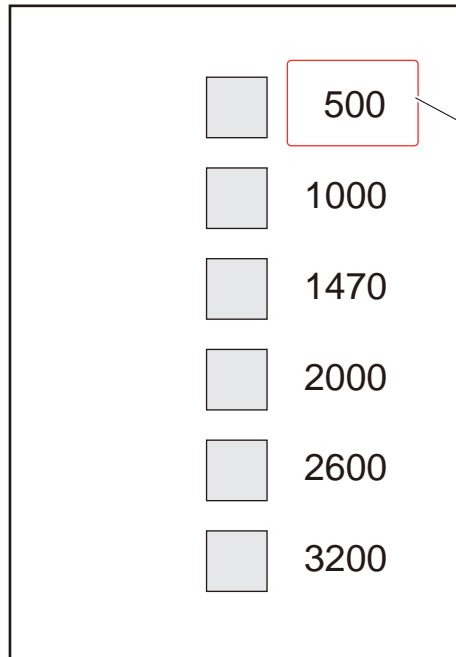
The 5. Adjustment screen is displayed.

- 4 . Press the 7. Endo Image Calibration button.



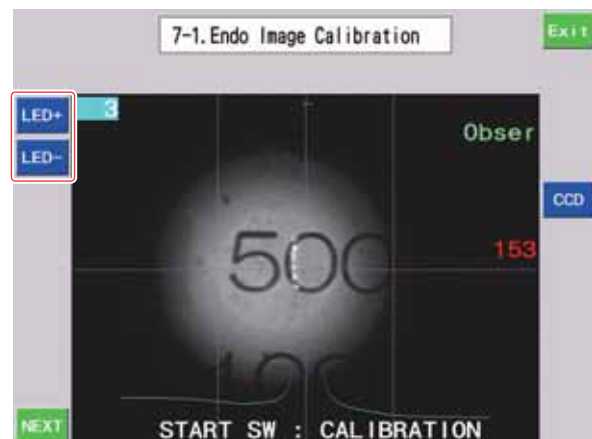
The 7-1. Endo Image Calibration screen is displayed.

- 5 . Align the capturing unit to the location where "500" can be seen.

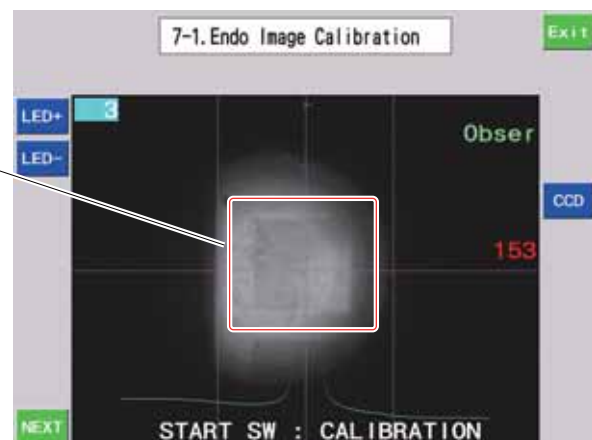
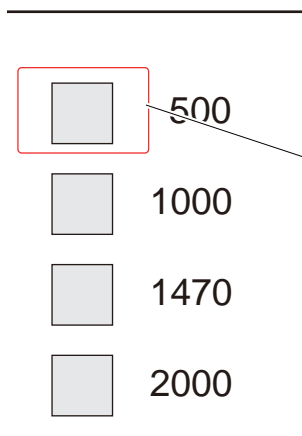


- 6 . Move the cell model eye jig to the right and left so that the horizontal center of the chart aligns almost to the center of the screen.

- 7 . Press the **LED+** or **LED-** button to adjust the LED intensity so that "500" can be seen clearly.

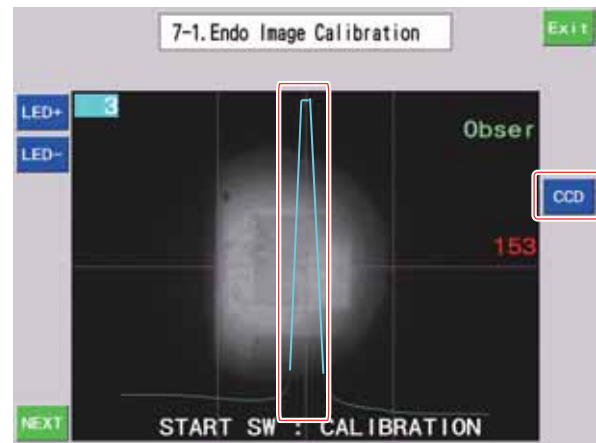


- 8 . Align the capturing unit so that the light gray square to the left of "500" moves almost to the center of the screen.




9 . Adjust the focus so that the peak of the CCD signal (light blue line) appears on the vertical line of the electric reticle.

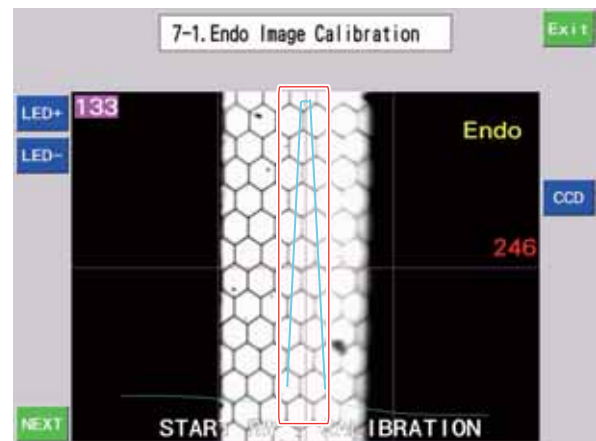
10. Press the **CCD** button.




11. The Endo display appears.

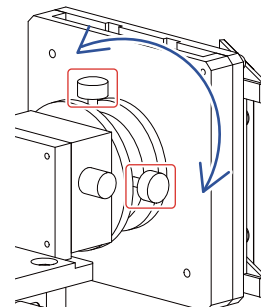
12. Move the capturing unit forward and backward with the joystick so that the center of the endothelial image is focused.

 Caution	If there is any dust, clean the model eye with a blower. Or, move the capturing unit up and down to find a location without any dust.
-------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

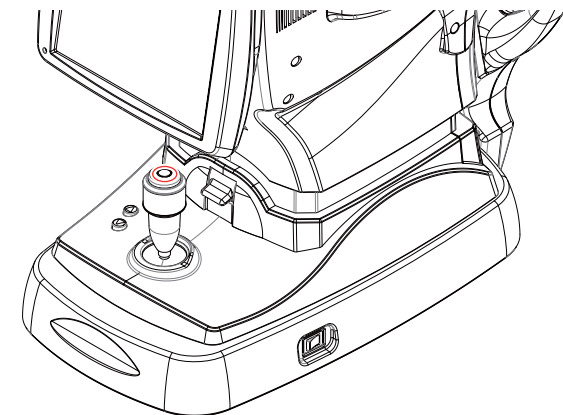


13. If the hexagon chart does not appear vertical, adjust the jig with the  $\theta$  axis micrometer so that the chart appears vertical.

 Caution	As the image is enlarged significantly, it shakes due to the vibration around the device.
---------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------



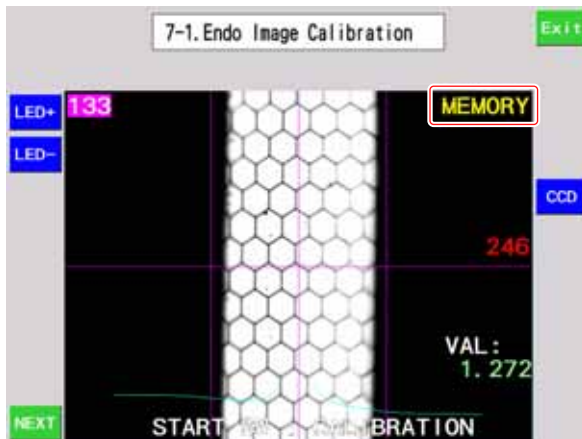
14. Press the start button of the joystick.



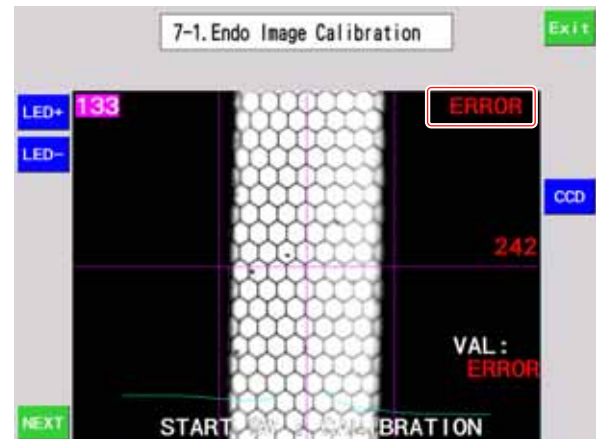


15. "MEMORY" appears on the screen.

If "ERROR" appears on the screen, start calibration again from the beginning (see 8.4.2 [p214]).

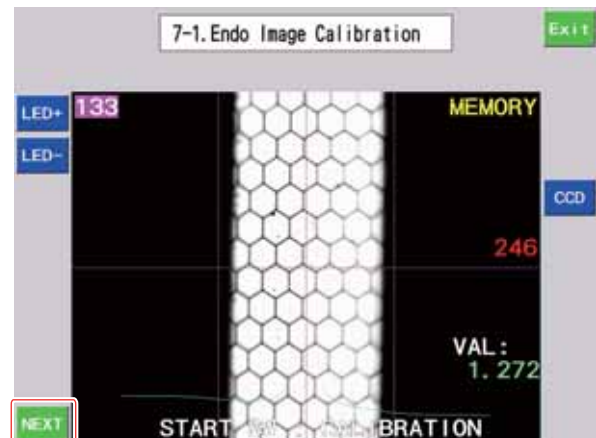


Satisfactory

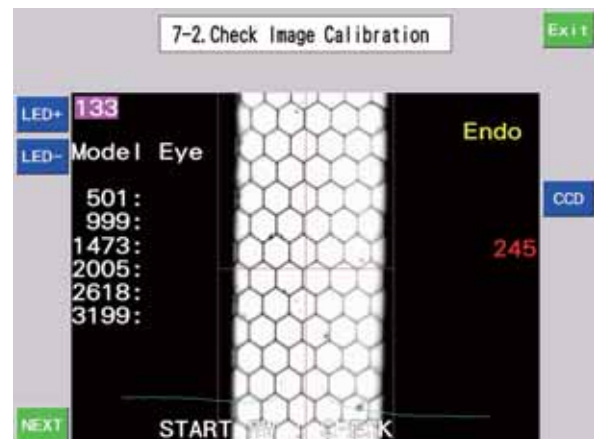


Unsatisfactory

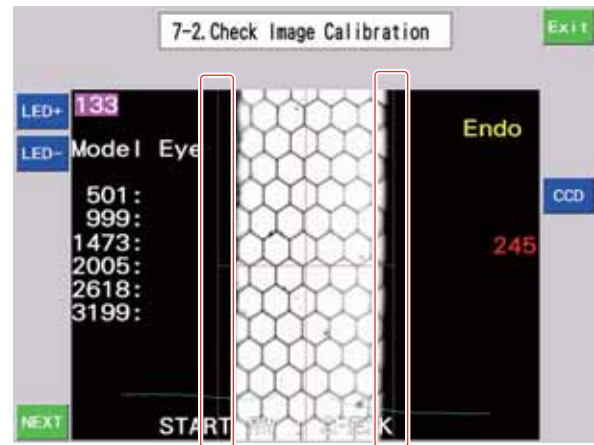
16. Press the **Next** button.



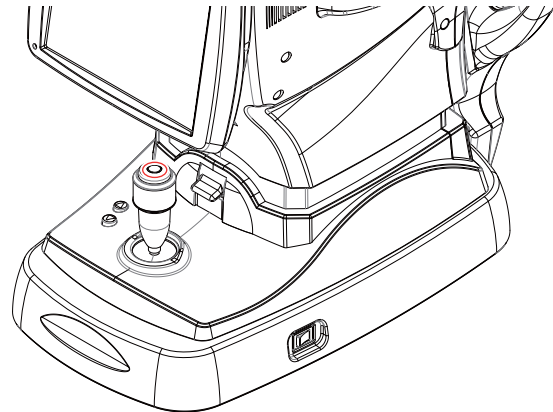
The Check Image Calibration screen is displayed.



17. Confirm that the endothelial image fits within the purple lines on either side.



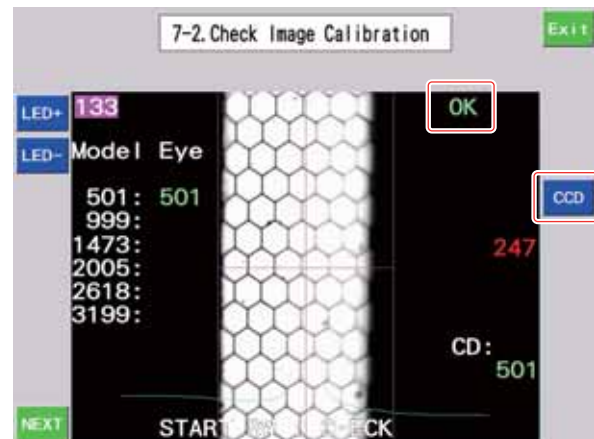
18. Press the start button of the joystick.



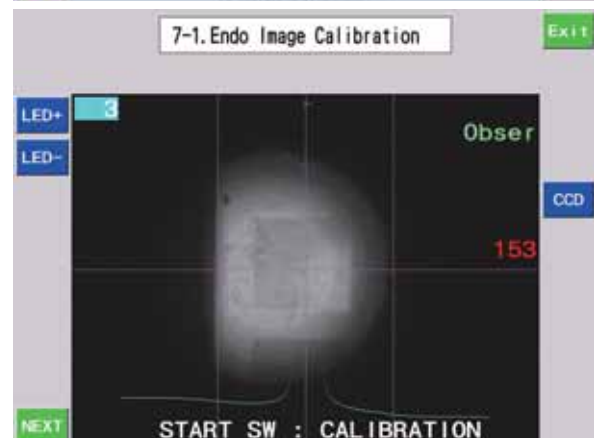
“OK” appears on the screen.

If “ERROR” appears on the screen, start calibration again from the beginning (see 8.4.2 [p214]).

19. Press the **CCD** button.

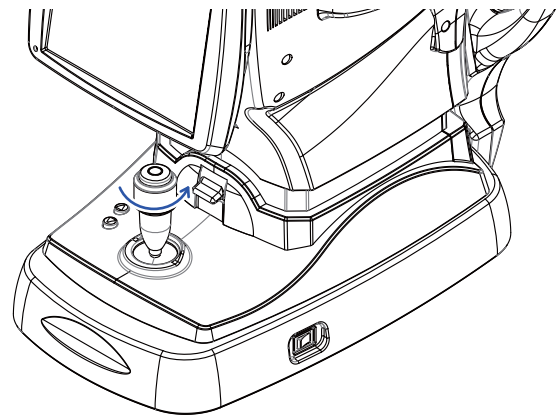
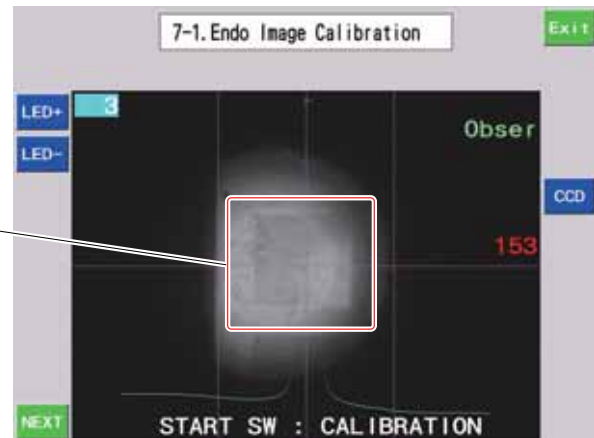
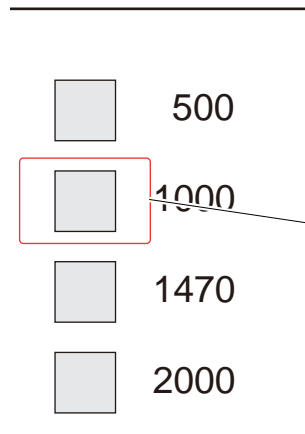


The observation display appears.

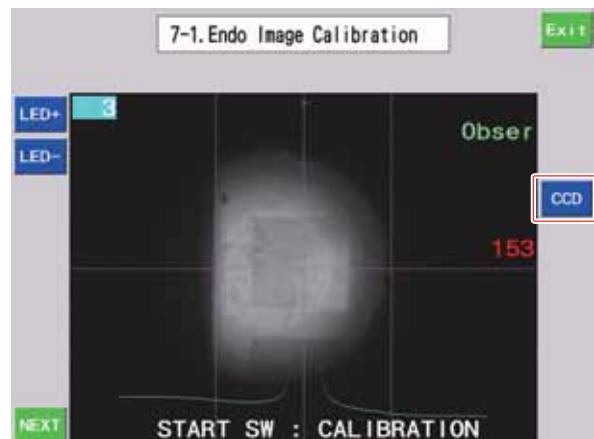





20. Turn the joystick knob counterclockwise to align the 1000 chart just below.

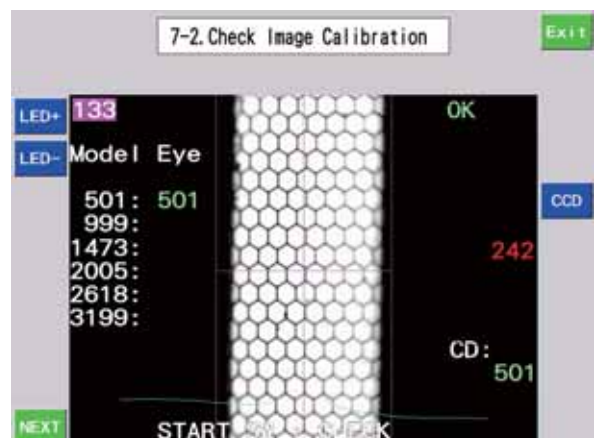


21. Press the **CCD** button.

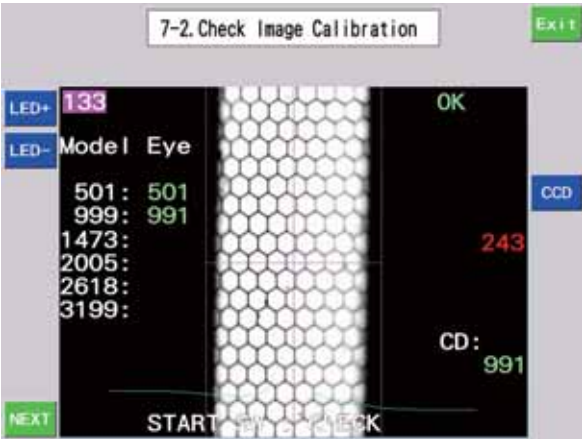


The Endo display appears.

 <b>Caution</b>	<p>At this time, confirm that the endothelial image fits within the purple lines on either side. If it does not, move the joystick forward and backward to adjust the focus.</p> <p>If it is difficult to see, press the <b>CCD</b> button to display the observation screen and adjust the focus.</p>
----------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

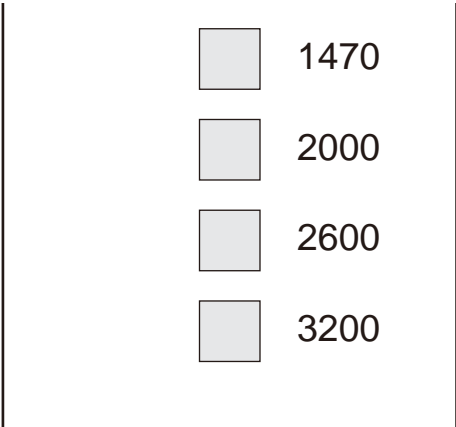


22. Press the start button of the joystick to calibrate the 1000 chart.
- If “ERROR” appears on the screen, start calibration again from the beginning (see 8.4.2 [p214]).

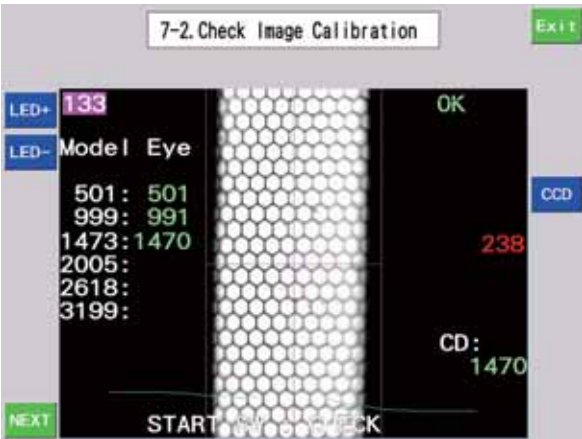


Calibrate the 1470, 2000, 2600, and 3200 charts the same as above.

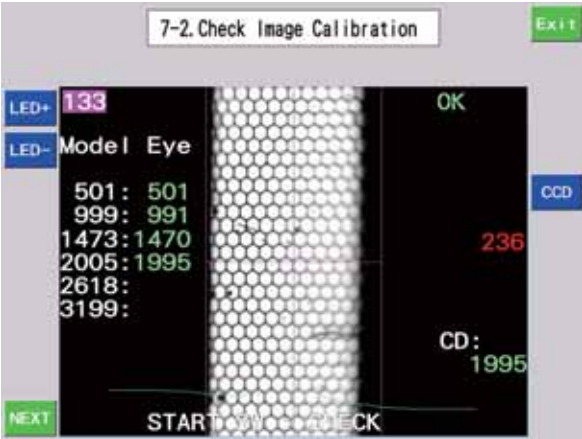
If “ERROR” appears on the screen, start calibration again from the beginning (see 8.4.2 [p214]).



Calibrate the 1470 chart.



Calibrate the 2000 chart.



Calibrate the 2600 chart.



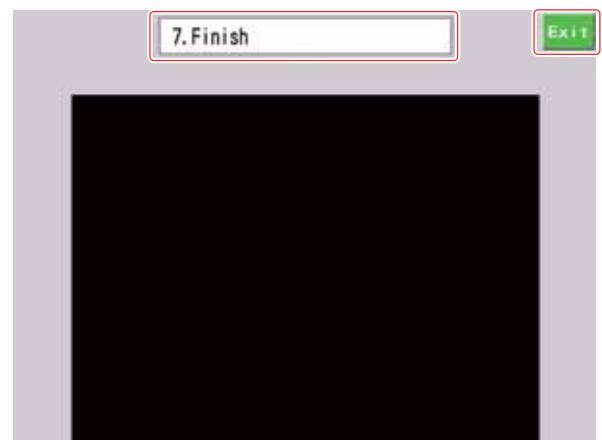
Calibrate the 3200 chart.



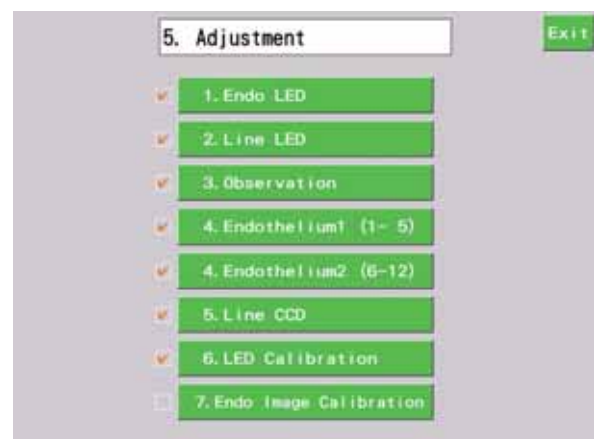
23. After calibrating all charts, press the Next button.

The 7. Finish screen is displayed.

24. Press the Exit button.



The 5. Adjustment screen is displayed again.

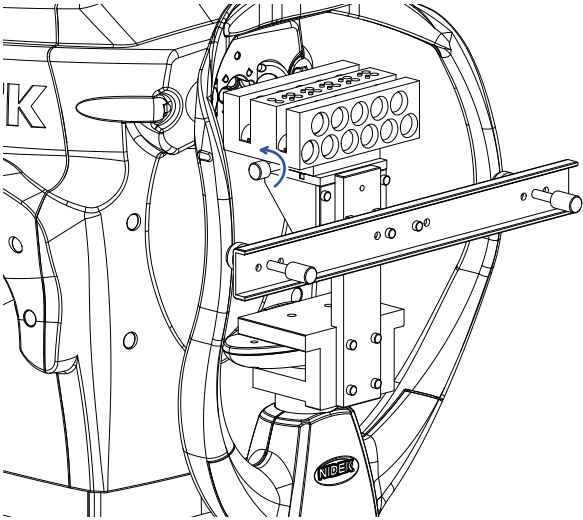



25. Perform the procedure as in “8.3.12 Endothelium measurement accuracy check” (p176).

### 8.4.3 Pachy calibration

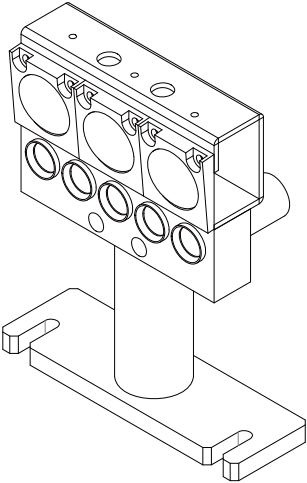
Task	Symptom
Recalibrate pachymetry.	5.8.8 Pachymetry data is not within normal range (p47)

- 1 . Adjust the LED.
- 1 ) Attach the 22-model eye jig (32171-0600).

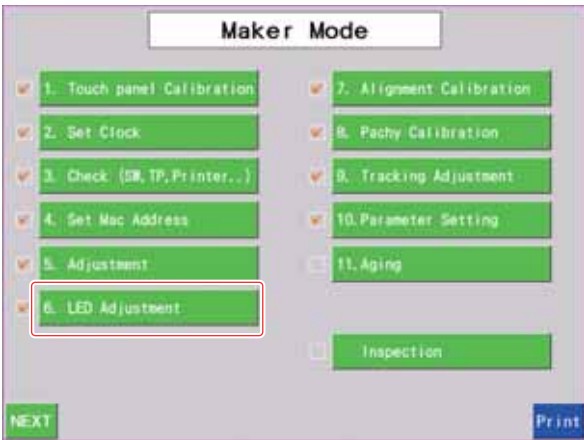


 Note

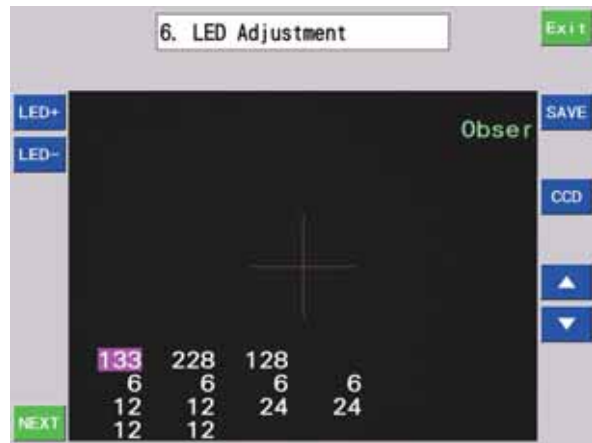
The LED can be adjusted with the 0 D model eye in the center of the simple calibration jig (32107-6200).



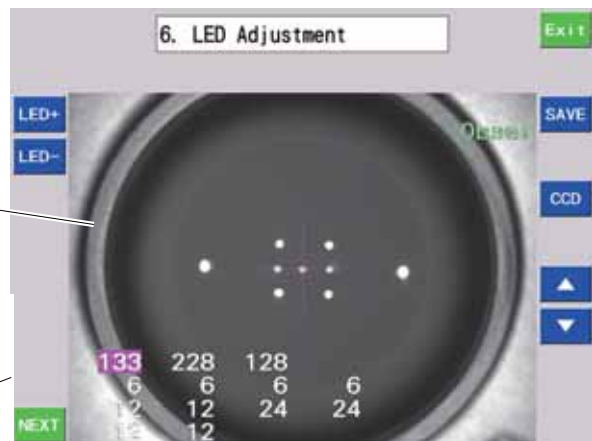
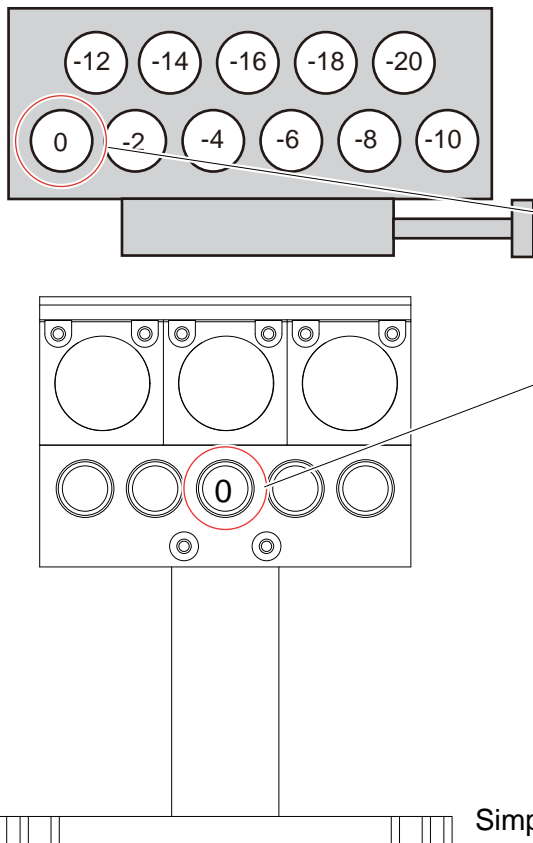
- 2 ) Activate Maker mode (see 8.1 [p137]).
- 3 ) Press the **6. LED Adjustment** button.



The 6. LED Adjustment screen is displayed.



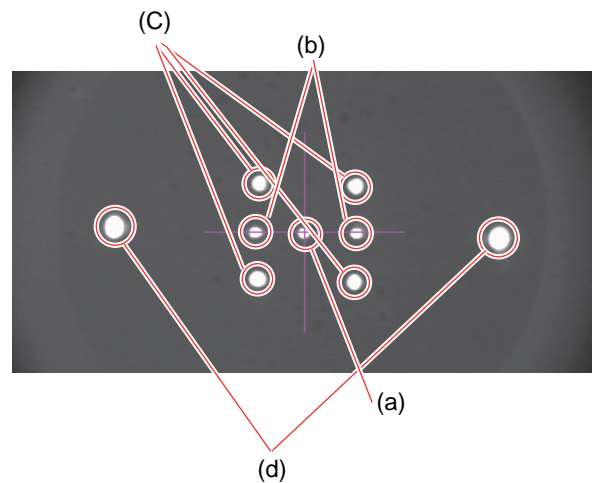
4 ) Align the capturing unit to the 0 D model eye.



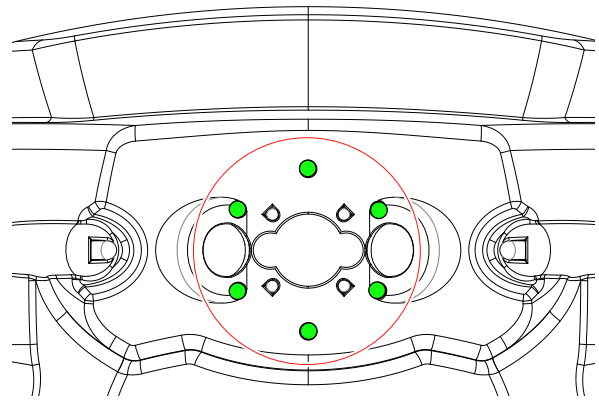
Simple calibration jig (32107-6200)

5 ) Confirm that the nine LEDs are lit.

- a . Central light spot
- b . Focus LED
- c . Alignment LED
- d . Illumination LED

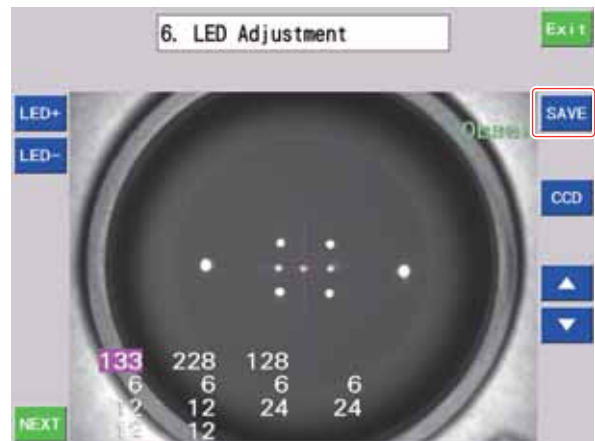


- 6 ) Confirm that the peripheral fixation lamp (six points) of the capturing unit front cover ASSY (15201-6300) are lit.



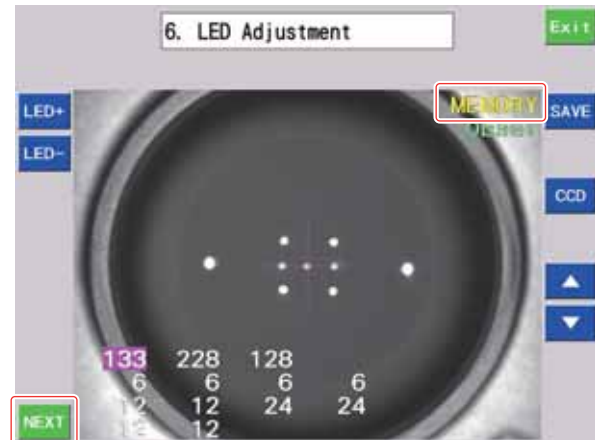
Peripheral fixation lamp illumination

- 7 ) Press the **SAVE** button.  
A short beep sounds.  
Two short beeps sound.



"MEMORY" appears on the screen.

- 8 ) Press the **Next** button.



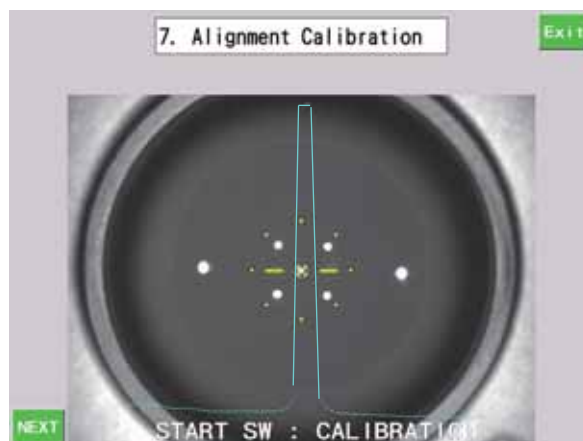
- 9 ) The 7. Alignment Calibration screen is displayed.





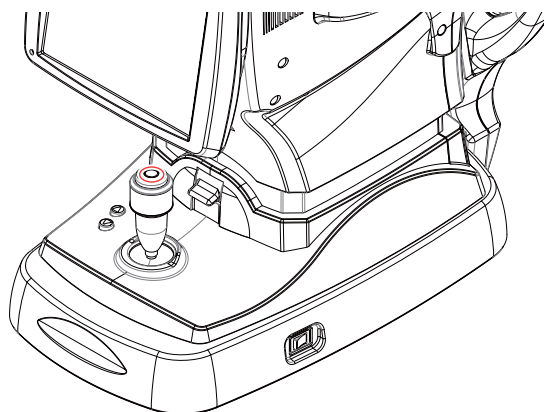
## 2 . Perform the alignment of the capturing unit.

- 1 ) Align the electric reticle to the position where the following conditions are met.
  - a . When alignment is complete, the electric reticle turns yellow.
  - b . The peak of the light blue waveform aligns with the center of the electric reticle.
  - c . X and Y directions: The central light spot is positioned in the center of the electric reticle.
  - d . Z direction: The center of the light blue waveform is positioned in the center of the electric reticle.

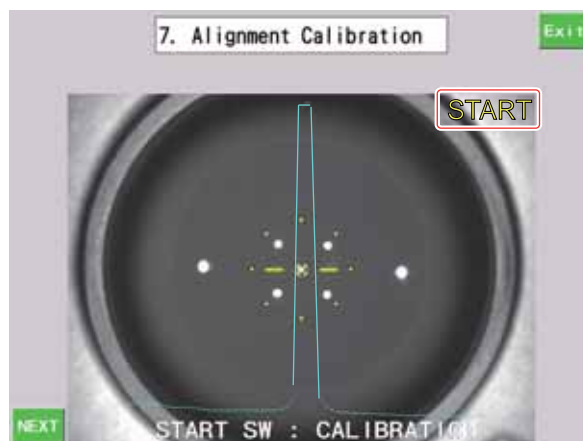


**Caution** The position is not where focus is obtained.

- 2 ) Press the start button of the joystick. A beep sounds.

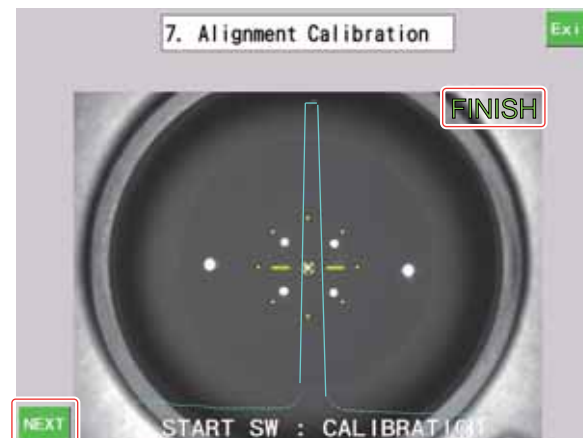


“START” appears on the screen.  
Two short beeps sound.



- 3 ) “FINISH” appears on the screen.

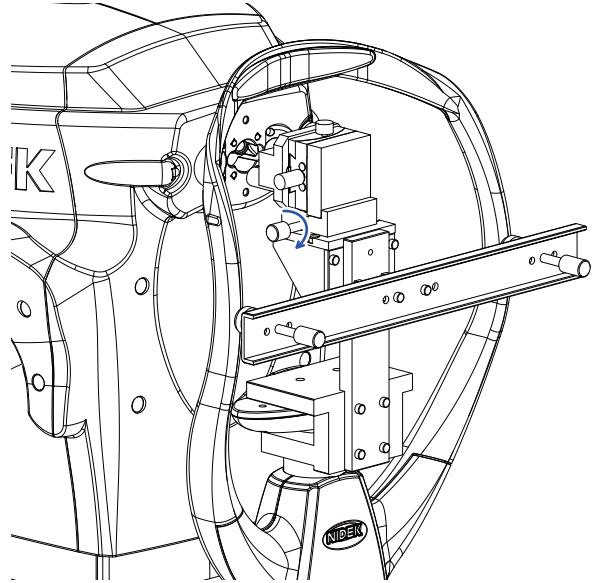
- 4 ) Press the **Next** button.



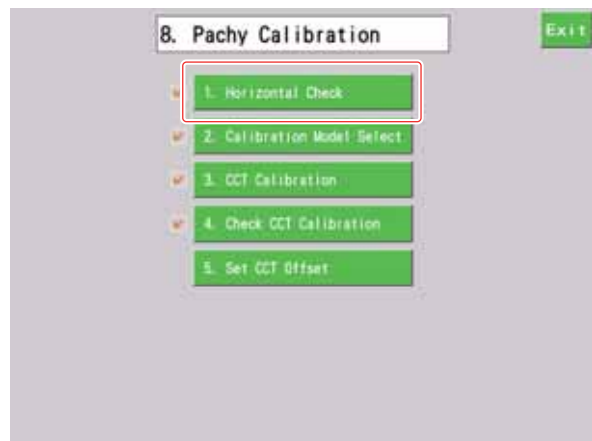
The 8. Pachy Calibration screen is displayed.



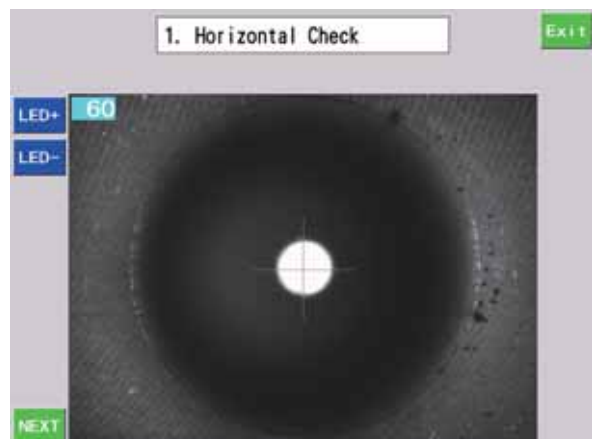
3 . Attach the calibration jig (15275-1400).



4 . Press the 1. Horizontal Check button.



The 1. Horizontal Check screen is displayed.

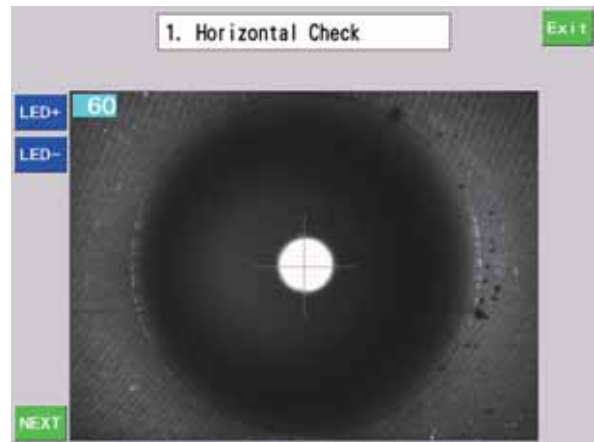
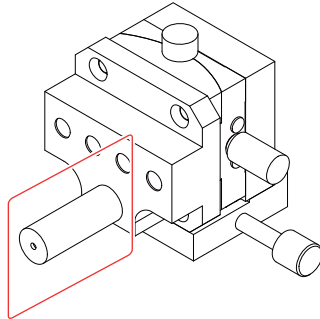




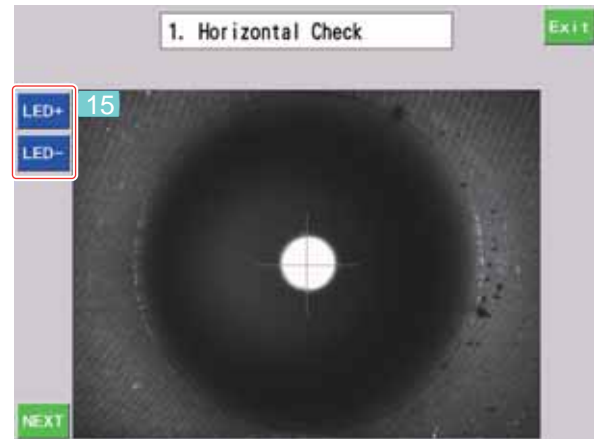
## 5 . Perform the alignment of the calibration jig (15275-1400).

**⚠ Caution** If the jig is not attached vertically, pachymetry cannot be performed properly.

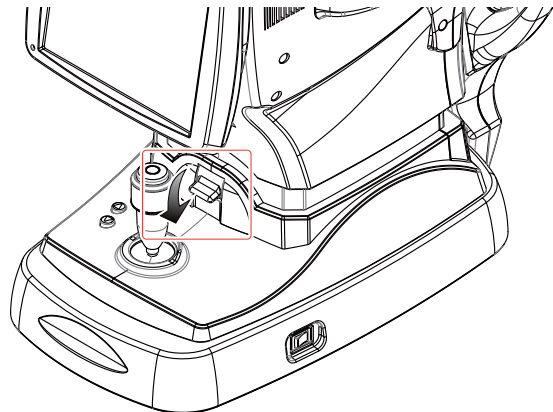
- 1 ) Align the capturing unit to the enclosed area of the calibration jig (15275-1400) as shown below.



- 2 ) Press the **LED+** or **LED-** button to set the LED intensity to 15.



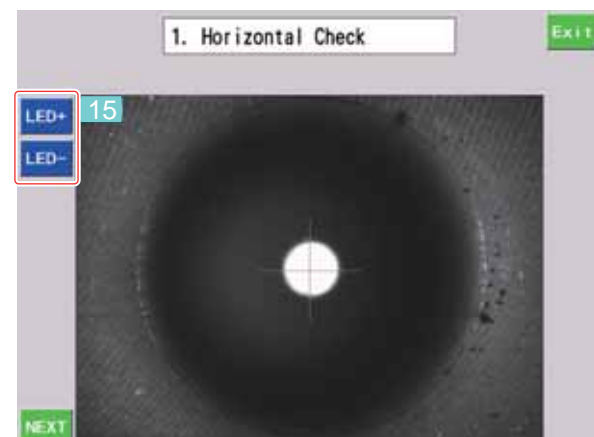
- 3 ) When coarse alignment is complete, lower the locking lever.



- 4 ) Confirm that the jig is attached vertically.

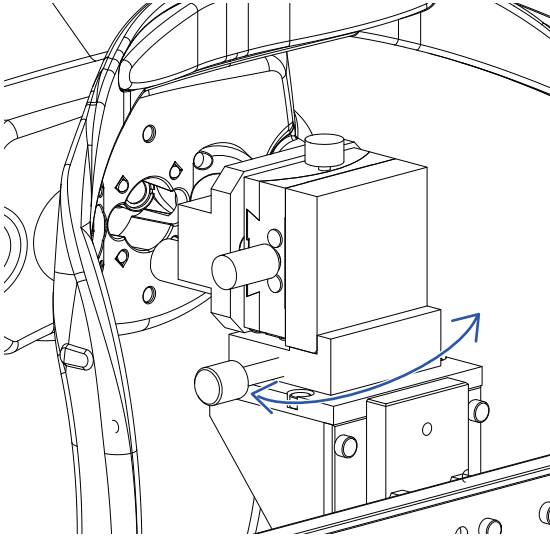
If the jig is vertical, the received light appears as a perfect circle.

**⚠ Caution** If the amount of reflection light is too much and the screen turns completely white, press the **LED-** button to reduce the light amount.

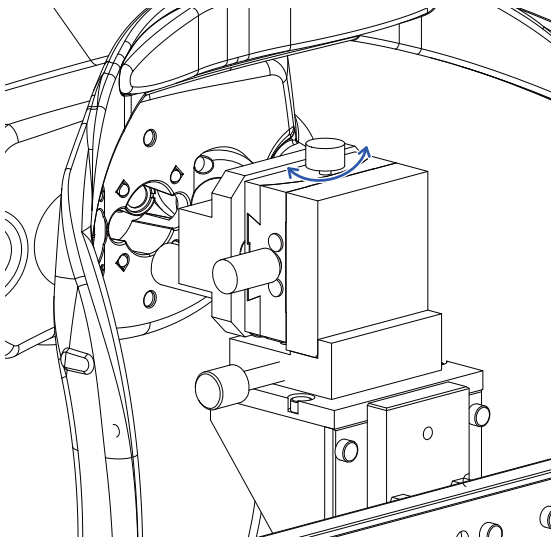


If the calibration jig (15275-1400) is tilted, adjust its position so that a perfect circle appears in the center.

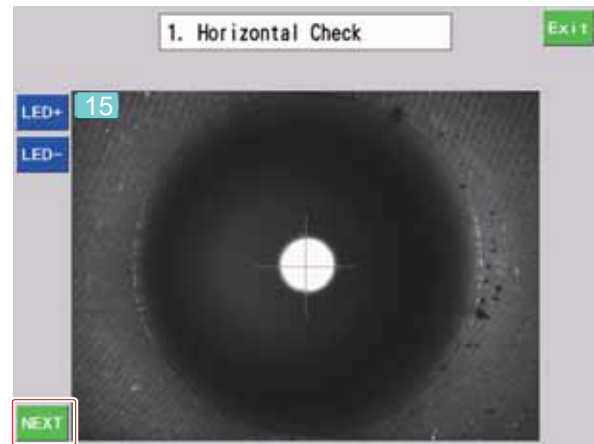
a . When tilted to the right or left



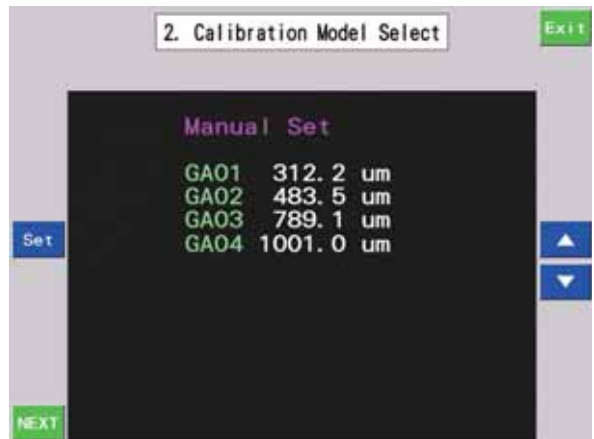
b . When shifted up or down



5 ) Press the **Next** button.



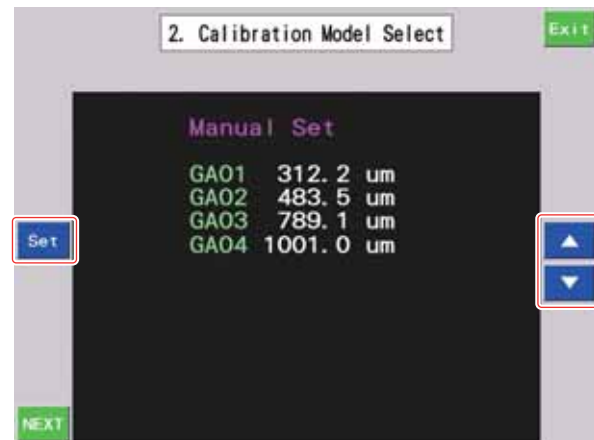
The 2. Calibration Model Select screen is displayed.





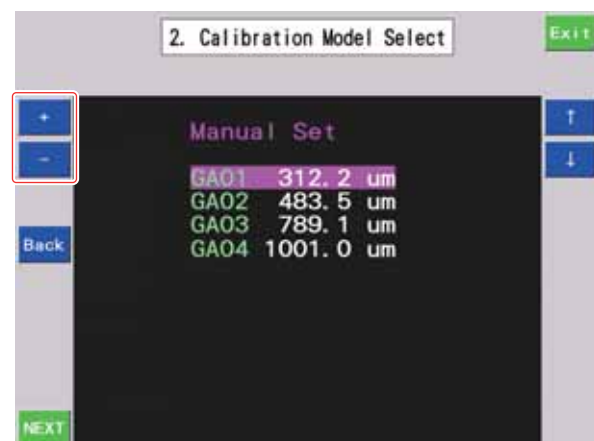
6 . Enter the calibration data of the calibration jig (15275-1400).



1 ) Press the  or  button to select "Manual Set".



2 ) Press the **Set** button.



3 ) Press the  or  button to enter the GA01 value indicated on the calibration jig (15275-1400).



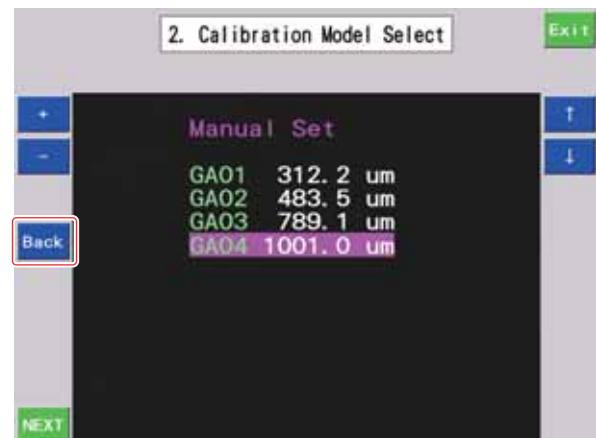
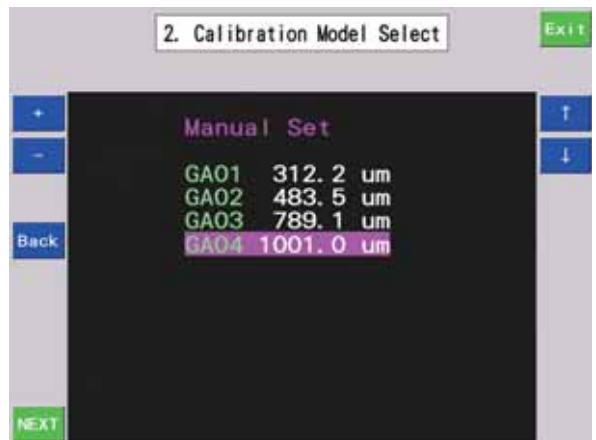
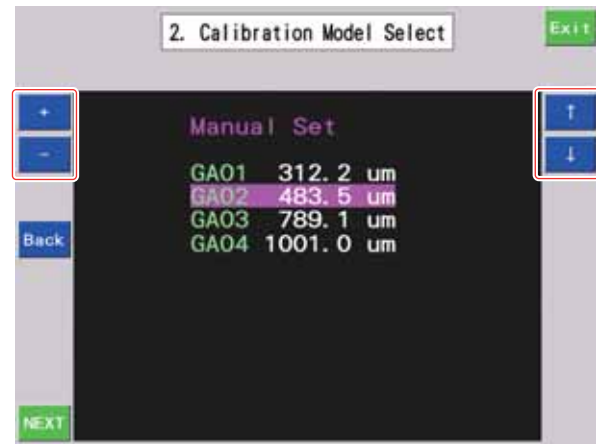
4 ) Press the  or  button to select GA02.

5 ) Press the  or  button to enter the GA02 value indicated on the calibration jig (15275-1400).

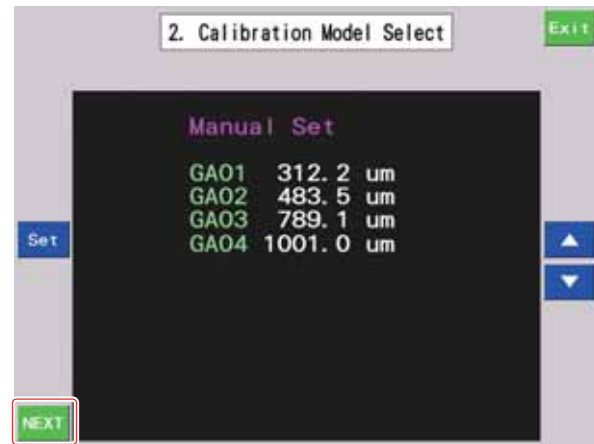
6 ) Enter the GA03 and GA04 values the same as above.  
GA03

GA04

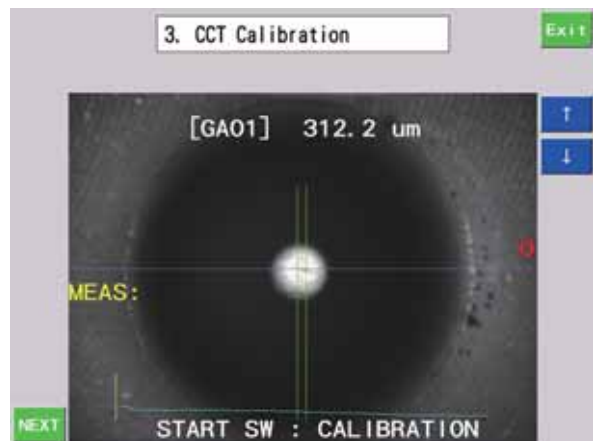
7 ) Press the  button.



7 . Press the **Next** button.

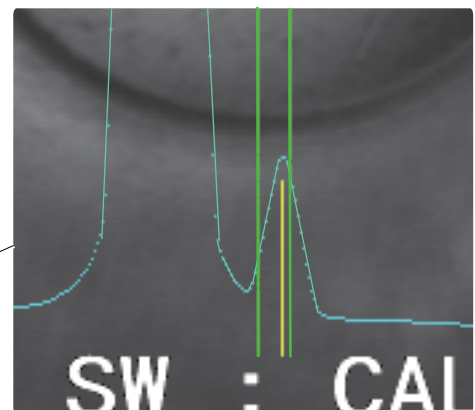
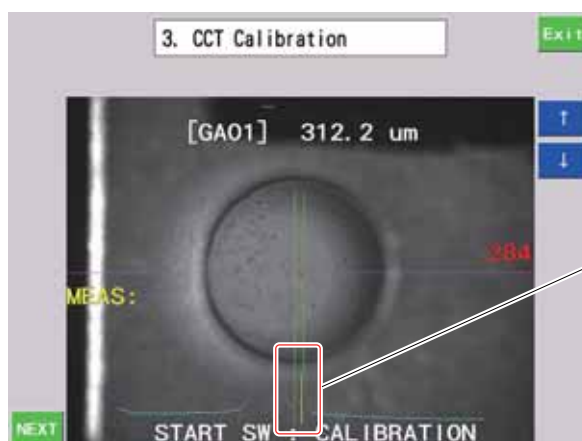
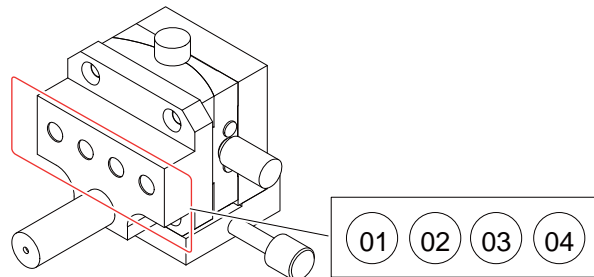


The 3. CCT Calibration screen is displayed.

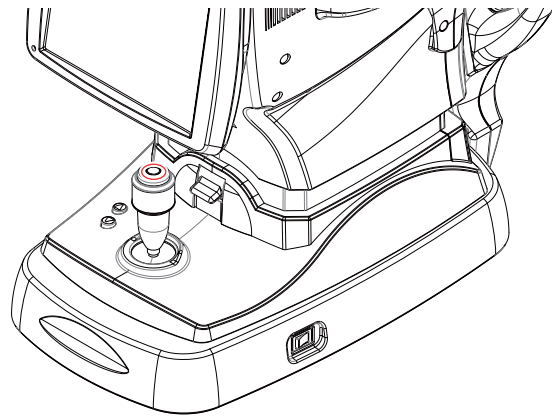


8 . Align the capturing unit to GAO1 of the calibration jig (15275-1400).

Perform alignment so that the two green vertical lines are positioned almost in the center of GAO1 and the right peak (smaller one) of the light blue waveform fits within the two green vertical lines.



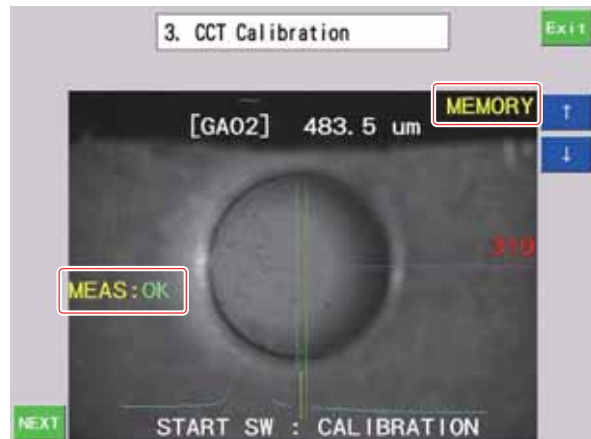
9 . Press the start button of the joystick.



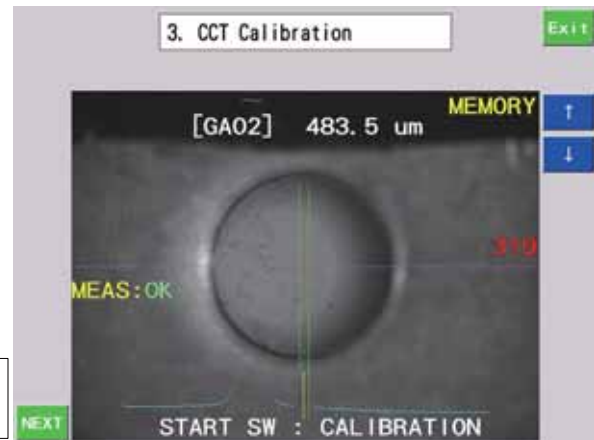
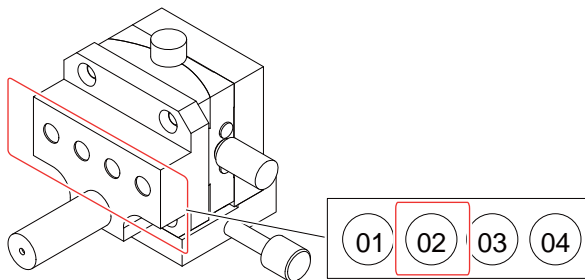
A short beep and continuous three beeps sound.

"MEMORY" appears on the screen.  
 "OK" appears to the right of "MEAS" and  
 the display switches to [GA02].

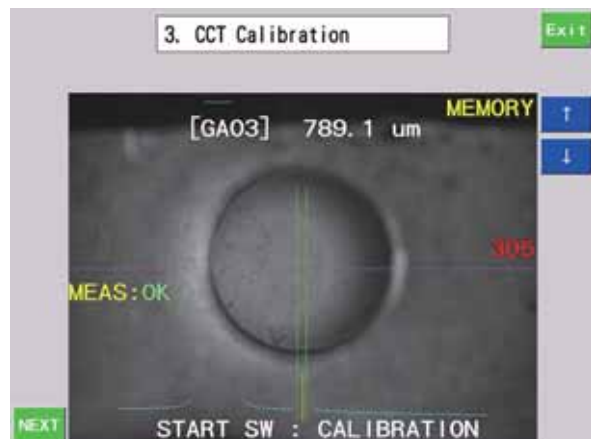
⚠ Caution	If a short beep and continuous two beeps sound and "ERR" appears, contact NIDEK.
-----------	----------------------------------------------------------------------------------



10. Align the capturing unit to GA02.

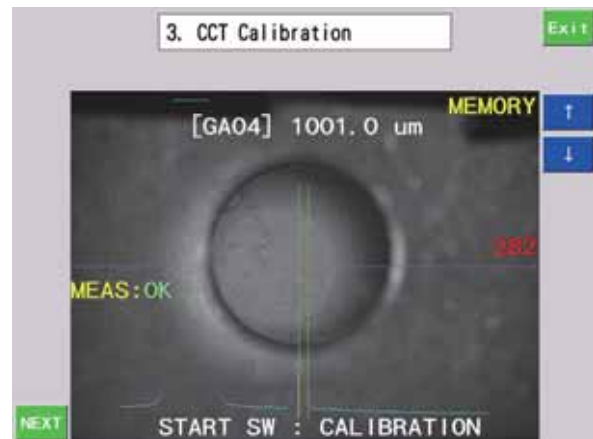


11. Calibrate GA02.





12. Calibrate GA03 and GA04 the same as above.

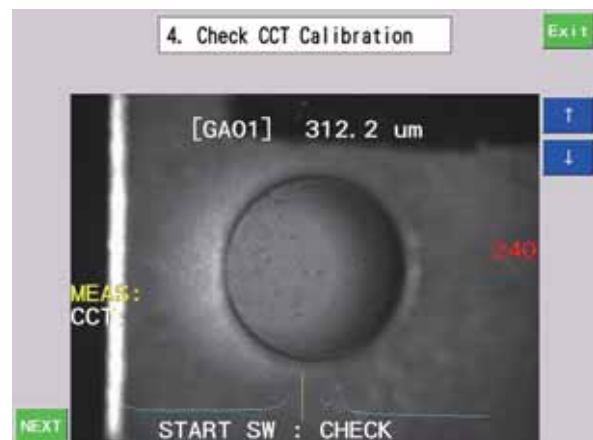


When the GA04 calibration is complete, a long beep sounds and "All Finished" appears on the screen.

13. Press the **Next** button.

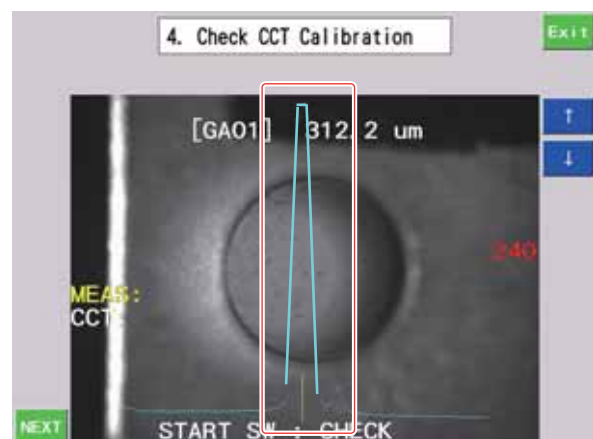


The 4. Check CCT Calibration screen is displayed.

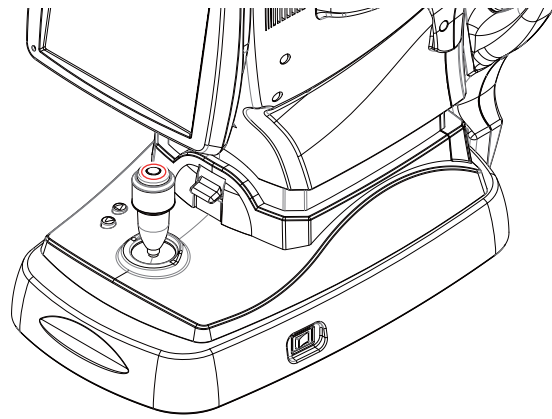


14. Align the capturing unit to GA01.

Align the center of GA01 to that of the purple reticle and align the horizontal center of the left peak of the light blue waveform to the purple vertical line.



15. Press the start button of the joystick.  
A beep sounds.  
Three short beeps sound.

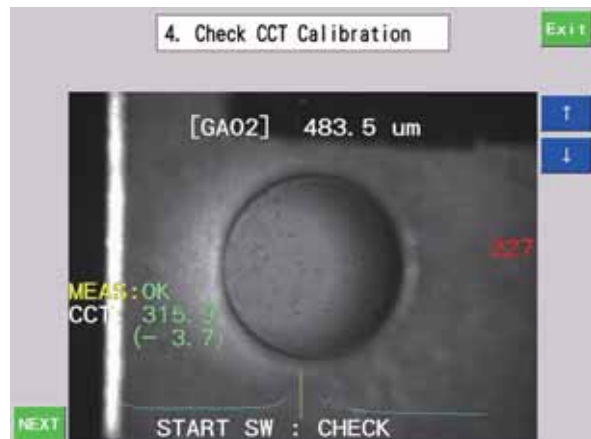


16. "OK" appears and the screen switches to [GA02].

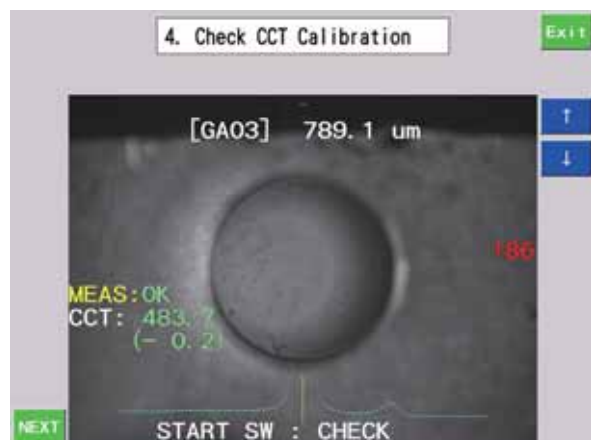
If "ERR" appears, perform the calibration procedure again (see 8.4.3 [p222]).



17. Align GA02.

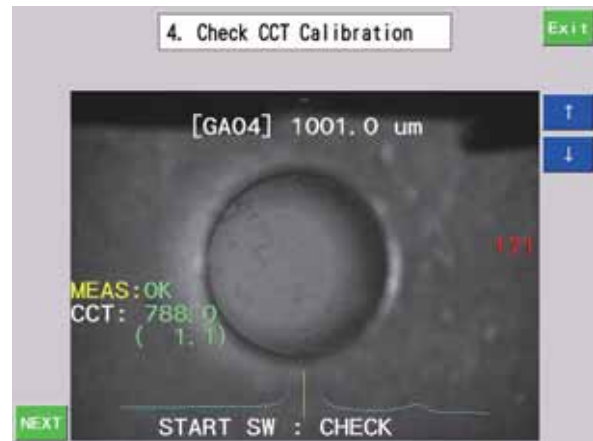


18. Perform the CCT calibration check for GA02.





19. Perform the CCT calibration check for GA03 and GA04 the same as above.



When the GA04 calibration check is complete, a long beep sounds and “All Finished” appears on the screen.

20. Press the **Next** button.



The 8. Pachy Calibration screen is displayed.

21. Press the **Exit** button.



22. The Maker Mode screen is displayed.




23. Perform the procedure as in “8.3.13 Pachymetry accuracy check” (p203).

### 8.4.4 Touch panel calibration

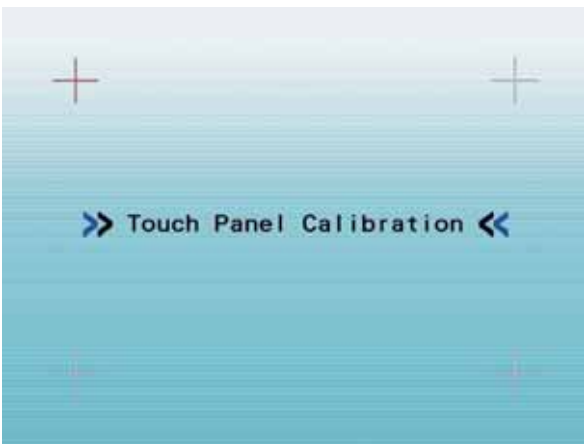
- 1 . Turn on the device.
- 2 . Activate Maker Mode (see 8.1 [p137]).
- 3 . Press the 1. Touch panel calibration button.



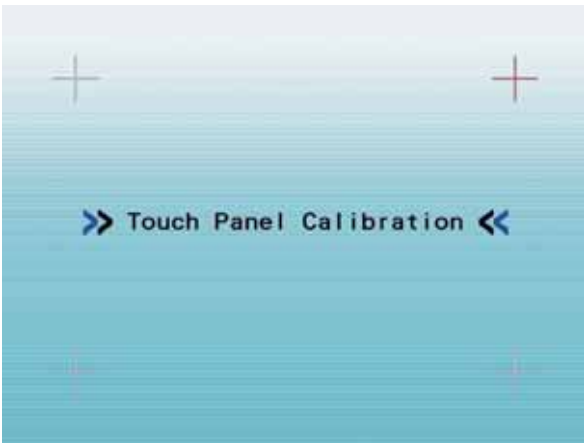
- The Touch Panel Calibration screen is displayed.
- 4 . Press the cross (in red) to the upper left.

 Caution

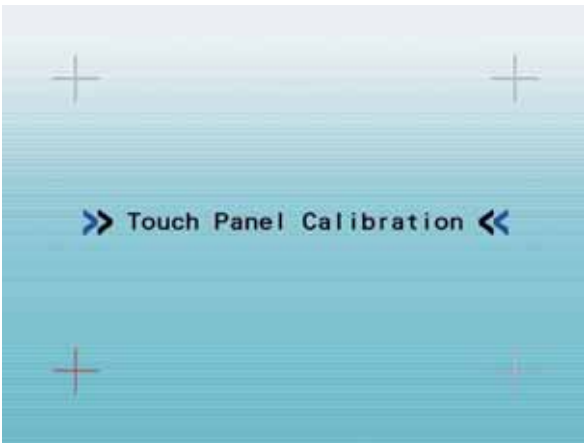
Press and hold the cross until it turns white.



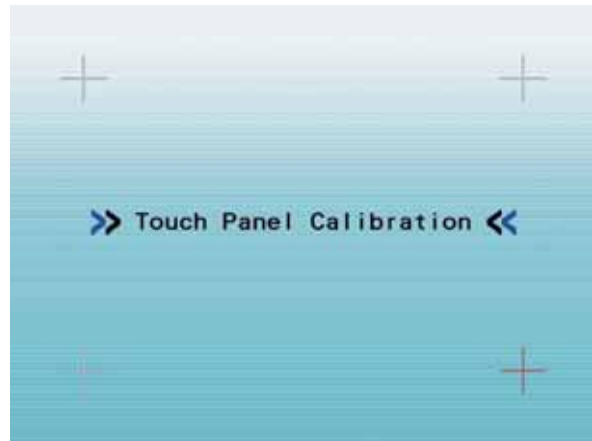
- 5 . Press the cross to the upper right.



- 6 . Press the cross to the lower left.



7 . Press the cross to the lower right.



The Maker Mode screen is displayed again.



8 . Perform the procedure as in "8.3.4 Touch panel check" (p156).

## 8.5 Upgrade


### 8.5.1 Software version check

1 . Turn on the device.

1 . Press the  button.



The menu window appears.

2 . Press the  button.

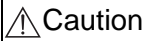


The Maintenance screen is displayed.

3 . The version information is indicated at the bottom of the screen.



## 8.5.2 Firmware upgrade



Caution

\* If a USB flash drive (30601-E030) is not available, it is recommended to use one manufactured by SanDisk.

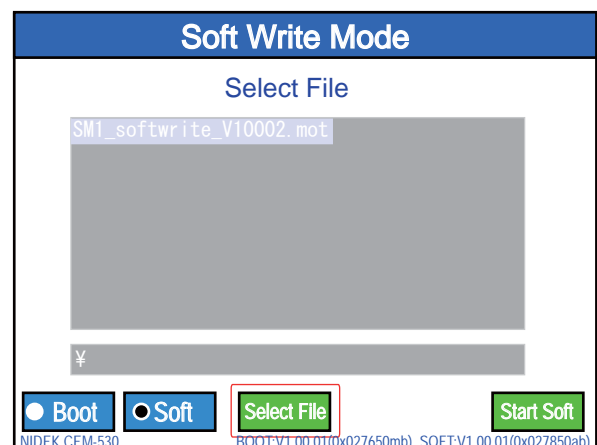
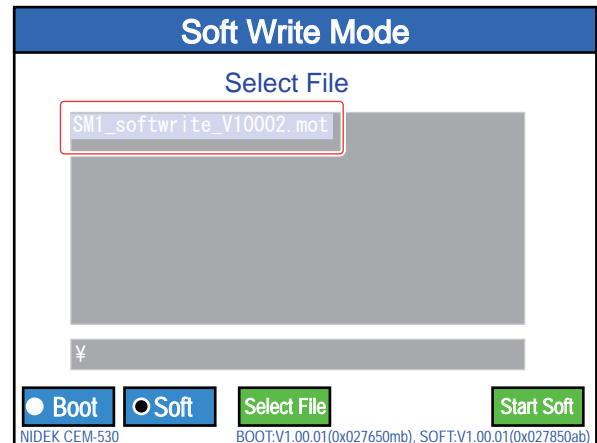
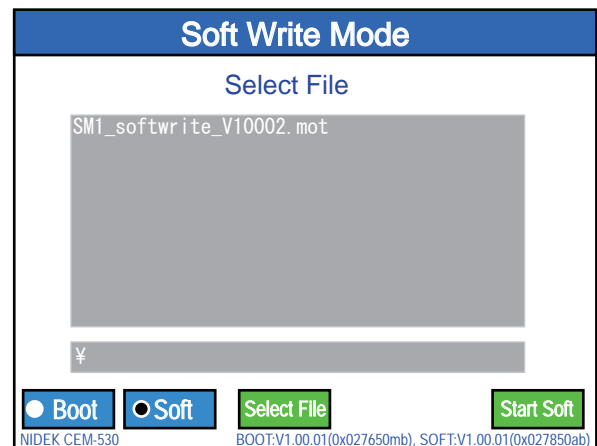
\* However, it is possible that the device does not recognize a USB flash drive even if it is a SanDisk product.

- 1 . Save the upgrade file to the root directory of the USB flash drive.
- 2 . Turn off the device.
- 3 . Connect the USB flash drive to the USB-A connector.
- 4 . While pressing the screen touch panel, turn on the device.

The Soft Write Mode screen is displayed.

- 5 . Select the upgrade file on the screen touch panel.

- 6 . Press the **Select File** button.



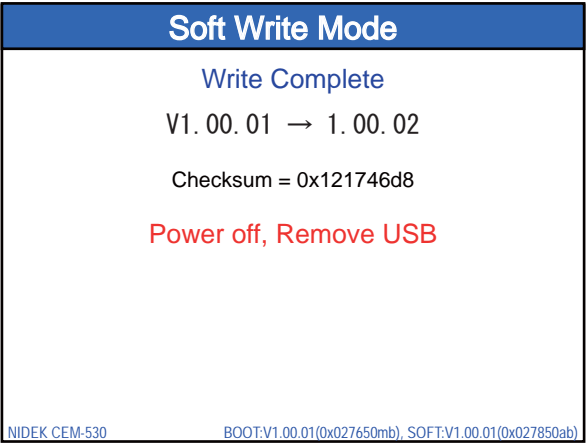
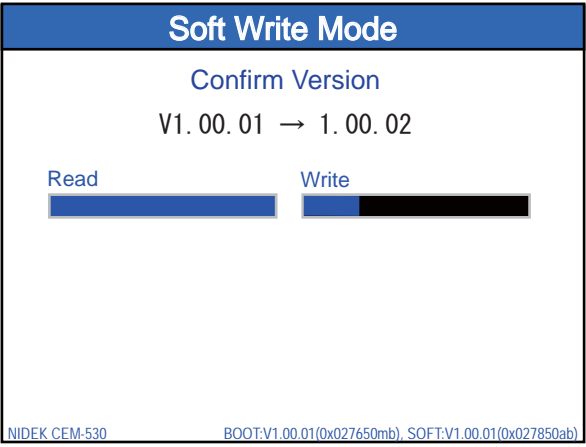
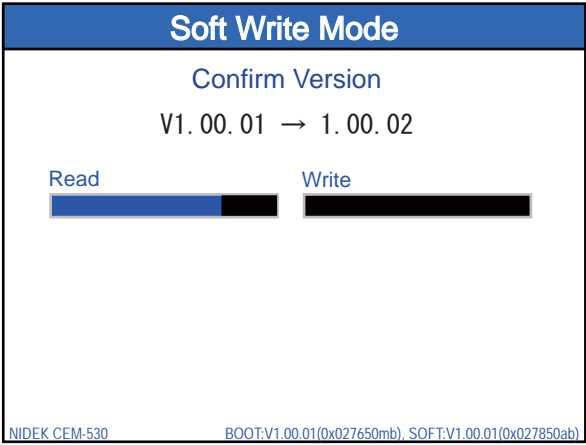
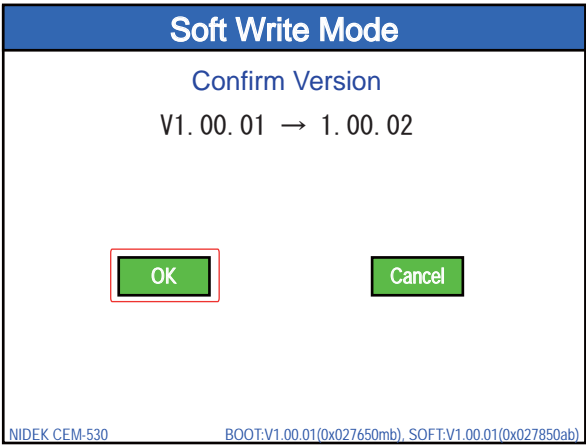
The Confirm Version screen is displayed.

7 . Press the  button.

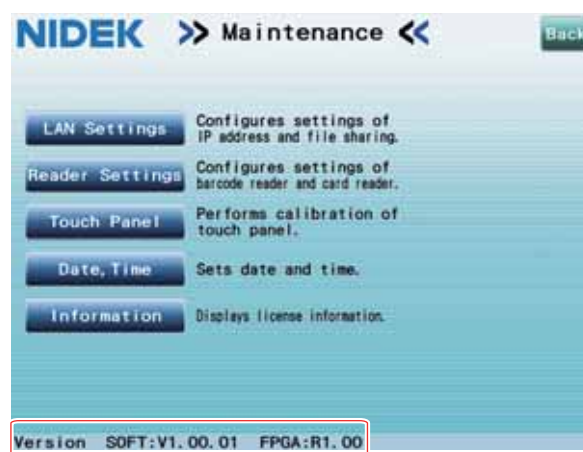
Upgrade starts.

When upgrade is complete, “Write Complete” appears.


- 8 . Turn off the device.
- 9 . Disconnect the USB flash drive.
- 10. Confirm that the device can be activated properly.



11. Check the software version (see 8.5.1 [p238]).



### 8.5.3 Adjustment data recovery

 Caution

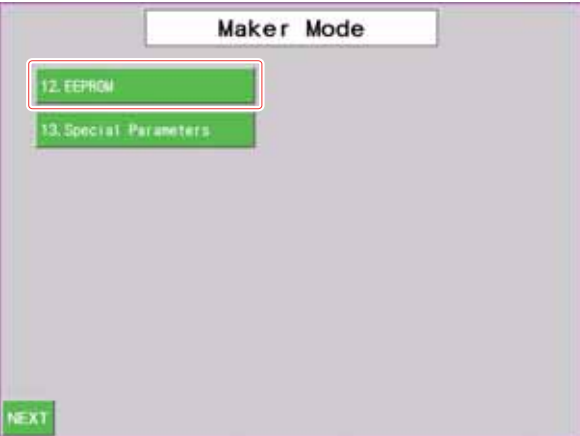
Perform the procedure here only when the driver board (15201-BA02) is replaced. Follow the procedure properly, or adjustment data saved in the driver board (15201-BA02) may be deleted.

1 . Activate Maker mode (see 8.1 [p137]).

Press the **Next** button.



2 . Press the **12. EEPROM** button.



The 12. EEPROM screen is displayed.

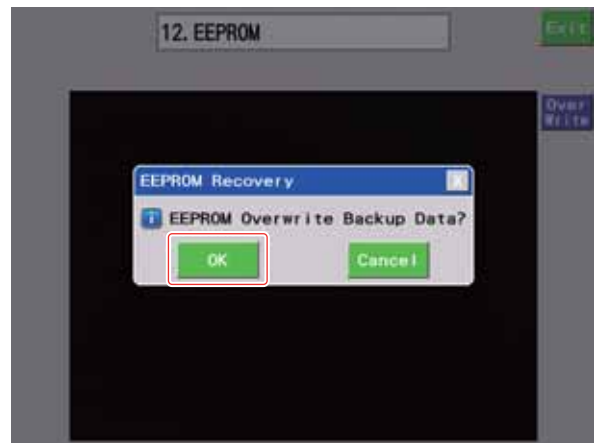
3 . Press the **Over Write** button.



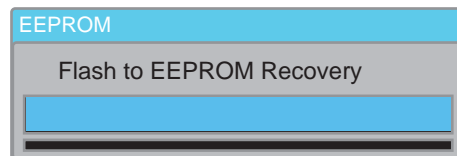
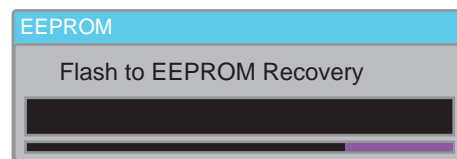


4 . The EEPROM Recovery dialog box appears.

5 . Press the  button.



Recovery starts.



When recovery is complete, the 12. EEPROM screen is displayed.



6 . Turn off then restart the device.

7 . Check the operation.

## 8.6 Settings

### 8.6.1 Preparation

#### 8.6.1.1 Maintenance

1 . Press the  button.



The menu window appears.

2 . Press the  button.



The maintenance screen is displayed.



### 8.6.1.2 Parameter settings

- 1 . According to the printed data of the Main-tenance screen, set the parameters for the customer (see 8.6 [p244]).

- 1 ) Press the  button.



The menu window is displayed.

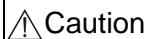
- 2 ) Press the  button.



The Settings screen is displayed.



## 8.6.2 LAN settings



Caution

When setting a LAN, consult the customer's system administrator regarding the settings.

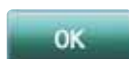
When not outputting data over a LAN, select File Sharing and set Output mode to "OFF".

### 8.6.2.1 Preparation

- 1 . Display the Maintenance screen (see 8.6.1.1 [p244]).
- 2 . Press the **LAN Settings** button.

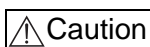
The LAN Settings screen is displayed.

- 3 . When setting is complete, press the



button.

The Maintenance screen is displayed again.



Caution

When the settings are changed, it is necessary to restart the device.

### 8.6.2.2 TCP/IP setting

Configure a network using TCP/IP.


1 . Display the LAN Settings screen (see 8.6.2.1 [p246]).

2 . Press the  button.  
The radio button turns on and the screen for the TCP/IP setting is displayed.



3 . When having an IP address assigned by the DHCP server

1 ) Press the  button.

The  check box is selected, and the IP address button and subnet mask button become disabled.



4 . When unchanging the IP address and subnet mask

1 ) Press the  button.

2 ) The  check box is cleared, and the IP address button and subnet mask button become enabled.



Note

Default settings

IP address: 192.168. 0. 70

Subnet mask: 255.255.255. 0

3 ) Press the **IP Address** button.



A numeric keypad appears.

4 ) Enter the IP address.

5 ) When setting is complete, press the



button.



6 ) Press the **Subnet Mask** button.



A numeric keypad appears.

7 ) Enter the subnet mask.

8 ) When setting is complete, press the



button.



### 8.6.2.3 File sharing setting

Using the file-sharing capabilities of the PC operating system, save images and capture data to the shared folder over a network.

- 1 . Display the LAN Settings screen (see 8.6.2.1 [p246]).

- 2 . Press the  button.



The radio button turns on and the screen for file sharing is displayed.



- 3 . Enter the user name as follows:  
Enter the user name of the destination PC.

- 1 ) Press the  button.



- 2 ) A keyboard appears on the screen.
- 3 ) Enter the user name.

- 4 ) Press the  button.





5 ) The user name is entered.



4 . Enter the password as follows:  
Enter the login password associated with the user name for the destination PC.

1 ) Press the  button.




2 ) A keyboard appears on the screen.  
3 ) Enter the password.

4 ) Press the  button.



5 ) The password is entered.

 **Caution** The password is masked with \*\*\*\*.





- 5 . Enter the domain as follows:  
Enter the domain name of the destination PC.

1 ) Press the  button.



2 ) A keyboard appears on the screen.

3 ) Enter the domain name.

4 ) Press the  button.




5 ) The domain name is entered.



- 6 . Enter the PC name as follows:  
Enter the name of the destination PC.

1 ) Press the  button.



- 2 ) A keyboard appears on the screen.
- 3 ) Enter the PC name.
- 4 ) Press the  button.



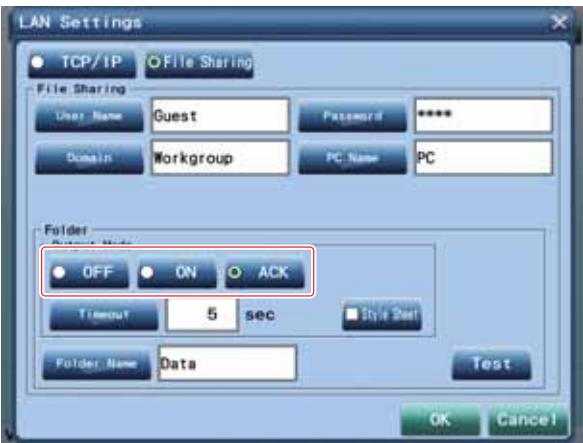
- 5 ) The PC name is entered.



7 . Set the folder as follows:

- 1 ) Select Output mode.


Display	Function
OFF	No connection
ON	Connection
ACK	Receives "ACK" from the destination PC.



- 2 ) Set a time frame for timeout.  
When "ACK" is selected in Output mode, set a time frame for timeout in "ACK" reception.

- a . Press the  button.




- A numeric keypad appears.
- b . Enter a time frame for timeout.
- c . Press the  button.



- 3 ) Enter the folder name.  
Enter the name of the shared folder in the destination PC.


- a . Press the  button.



- A keyboard is displayed on the screen.
- b . Enter the name of the shared folder.
- c . Press the  button.




- 4 ) Set the style sheet output.  
If the shared folder does not contain a style sheet file, create one.

- a . Press the  button.
- b . The check box is selected and the style sheet output is enabled.



## 5 ) Test the connection.

- a . Pressing the  button executes the connection test.



### 8.6.3 Reader settings

1 . Display the Maintenance screen (see 8.6.1.1 [p244]).

2 . Press the **Reader Settings** button.



The Reader Settings window is displayed.

3 . Press the **Barcode** or **Card** button to select the reader to be connected.

4 . The radio button for the selected reader turns on.



5 . Card reader setting

When the card reader is selected, the start position and length of characters to be read as an ID can be set.

1 ) Start setting

a . Press the **Start** button.



A numeric keypad appears.

b . Enter a numeric value for reading start position of the ID.

c . Press the **OK** button.

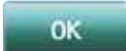




## 1 ) Length setting

- a . Press the  button.



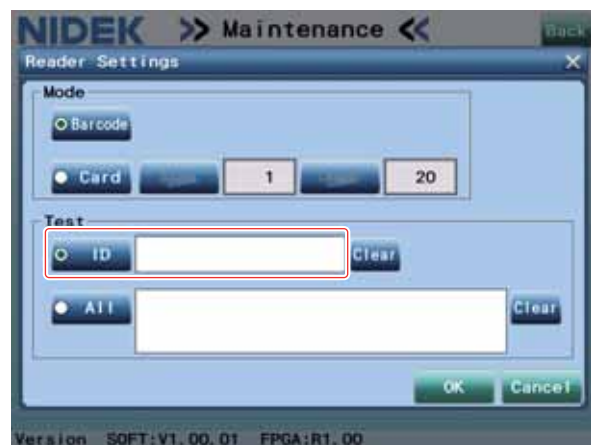
- A numeric keypad appears.
- b . Enter the length of data to be read as the ID.
- c . Press the  button.



## 6 . ID reading test

- 1 ) Read a barcode with the barcode reader, or read a card with the magnetic card reader.

- a . Selecting  displays codes set in the Start and Length fields.



- b . Selecting  displays all codes.



- 2 ) Pressing the  button clears the field.



- 7 . When setting is complete, press the



button.



The Maintenance screen is displayed again.



## 8.6.4 Touch panel calibration

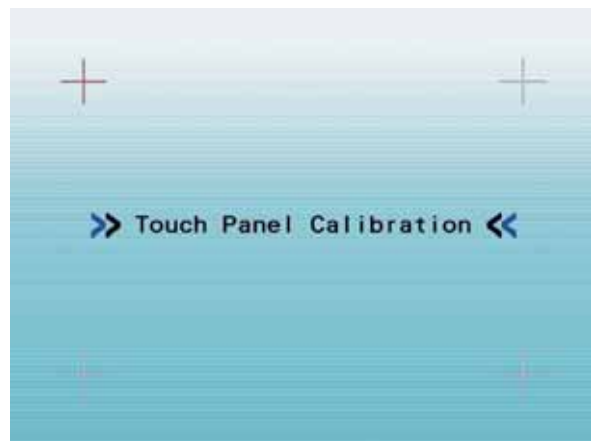
- 1 . Enter the Maintenance screen (see 8.6.1.1 [p244]).
- 2 . Press the **Touch Panel** button.



The Touch Panel Calibration screen is displayed.

- 3 . Press the cross (in red) to the upper left.

⚠ Caution	Press and hold the cross until it turns white.
-----------	------------------------------------------------



- 4 . Press the cross to the upper right.



- 5 . Press the cross to the lower left.





6 . Press the cross to the lower right.




The Maintenance screen is displayed again.



Note

The touch panel calibration can be performed in Maker mode as well. See "8.4.4 Touch panel calibration (p236)".

## 8.6.5 Date and time setting


- 1 . Display the Maintenance screen (see 8.6.1.1 [p244]).
- 2 . Press the  button.



The Date, Time window is displayed.

- 3 . Press the  or  button to change the date and time.



- 4 . After setting is complete, press the  button.



The Maintenance screen is displayed again.



## 8.6.6 Information check

- 1 . Display the Maintenance screen (see 8.6.1.1 [p244]).  
The version information is indicated at the bottom of the screen.

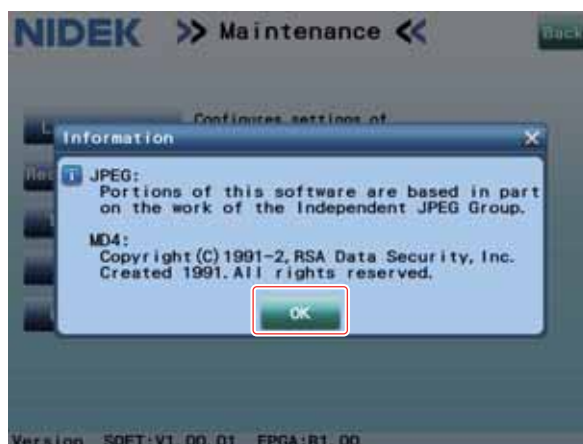


- 2 . Press the  button.



The license information appears.


- 3 . Press the  button.



The Maintenance screen is displayed again.



## 8.6.7 Capture condition setting

- 1 . Display the Settings screen (see 8.6.1.2 [p245]).
- 2 . Press the  button.



The Settings screen for “Take” is displayed.

- 3 . Fixation: Blink  
Select the check box when setting the internal fixation lamp or peripheral fixation lamp to blink.



- 4 . Result Display  
Select whether to display the capture results screen as a single display or multiple display (single display and multiple display are switched depending on the capture count).



Mode	Function
Single Mode	Regardless of the capture count, the capture results screen is always shown as a single display. One capture data set is displayed for each eye. When image capture is performed more than once for one eye, only the latest capture data is displayed.
Multi Mode	Depending on the capture count, the capture results screen is automatically shown as a single display or multiple display. When image capture is performed only once for either eye, the capture results screen is shown as a single display for that eye. In other cases, it is shown as a multiple display. In Multi Mode, a maximum of 10 capture data sets can be stored in the memory for each eye.

##### 5 . Data Clear confirmation

When capturing a new patient's eye, select whether to display a dialog box confirming about deletion of the current capture data.



##### 6 . After setting is complete, press the




button.

The Capture screen is displayed again.



### 8.6.8 Print setting

- 1 . Display the Settings screen (see 8.6.1.1 [p244]).
- 2 . Press the  button.





The Settings screen for “Print” is displayed.



- 3 . Printer
  - 1 ) OFF, ONSet whether to print the analysis results.



Mode	Function
OFF	Data is not printed. Pressing the  button after image capture produces data output only (when data output is set to “ON”).
ON	Pressing the  button after image capture prints data out.



## 2 ) Print Mode

Set the printing contents. When "Printer" is set to "ON", this mode is enabled.



Mode	Function
Built-in	Data is printed from the built-in printer.
Video	Data is printed from the optional video printer.

## 3 ) Patient No.

Set the patient number of the printing contents.



- a . Press the  button.

The Set No. window is displayed.

- b . Enter the patient number with the numeric keypad.

- c . Press the  button.



Note

To reset the number to "0001", use the Set No. window.

The patient number differs from the patient ID. It is automatically assigned and printed.

For the built-in printer, the patient number is printed only when the Built-in Printer Option "Patient No." check box is selected. For the video printer, the patient number is always printed.

The Settings screen for “Print” is displayed again.



#### 4 ) Data Clear: Print&Clear

This check box is selected to clear the capture data (patient information, image data, and analysis data) and display the capture screen when printing is performed.

However, this setting is disabled when the Print Mode parameter is set to “Video”.



#### 5 ) Built-in Printer Option

Set the printing contents. Checked items are printed.



Items	Description
Date Print	The current date and time are printed.
Patient No.	Patient No. is printed.
Econo.Print	Lessens the space between lines of printout. This saves printer paper.
Name Print	Patient name is printed. When no name is entered as patient information, “NAME (space) M/F” is printed to allow the operator to write the name and sex by hand.
Image Print	The selected endothelial image is printed.
Comment Print	“NIDEK CEM-530” is printed at the end of each print.



4 . When setting is complete, press the



button.

The Capture screen is displayed again.



## 8.6.9 Other settings

1 . Display the Settings screen (see 8.6.1.1 [p244]).

2 . Press the  button.



The Settings screen for “Others” is displayed.

3 . Set the following.

1 ) Language

Select the language displayed on the screen between Japanese and English.

2 ) Date Format

Select the print date format.

3 ) Beep

Set the beep tone during operation. When “OFF” is selected, no beep sounds.

4 ) LCD Backlight

Set the LCD brightness.

5 ) Name

Set the display order of the last name, first name, and middle name.

6 ) Sleep Time

Set a time frame to enter sleep mode when the device has not been used. When “OFF” is selected, the device does not enter sleep mode.



4 . When setting is complete, press the

 button.

The Capture screen is displayed again.



## 8.6.10 Printing

The settings on the Maintenance screen and Settings screen can be printed with the built-in printer.

1 . Display the Settings screen (see 8.6.1.1 [p244]).

2 . Press the  button.



The Print dialog box appears.

3 . Press the  button.



The saved parameter data is printed.

----- MAINTENANCE -----	
LAN SETTING	
TCP / IP	
DHCP	NO
IP ADDRESS	192. 168. 0. 70
SUBNET MASK	255. 255. 255. 0
SILE SHARING	
USER NAME	Guest
PASSWORD	****
DOMAIN	
PC NAME	Workgroup
	PC
DATA	
OUTPUT MODE	ACK
TIME OUT	5
STYLE SHEET	OFF
FOLDER NAME	Data
READER SETTINGS	
MODE	BARCODE
START	--- LENGTH ---
DATE , TIME	
2011 / 10 / 27	09:59
----- PARAMETERS -----	
TAKE	
FIXATION BLINK	YES
RESULT DISPLAY	MULTI
CHECK DATA CLEAR	ON
PRINT	
PRINTER	ON
PRINTER MODE	BUILT-IN
SET NO.	0001
PRINT&CLEAR	NO
DATA PRINT	YES
PATIENT NO.	YES
RCONO. PRINT	NO
NAME PRINT	YES
IMAGE PRINT	YES
COMMENT PRINT	YES
OTHERS	
LANGUAGE	ENGLISH
BEEP	OFF
LCD BACKLIGHT	LOW
NAME	L. F MI.
SLEEP TIME(MIN)	5
DATA FORMAT	Y / M / D
----- PROGRAM VERSION -----	
SOFT VER :	V 1. 00. 01
FPGA VER :	V 1. 00

This page is intentionally left blank.

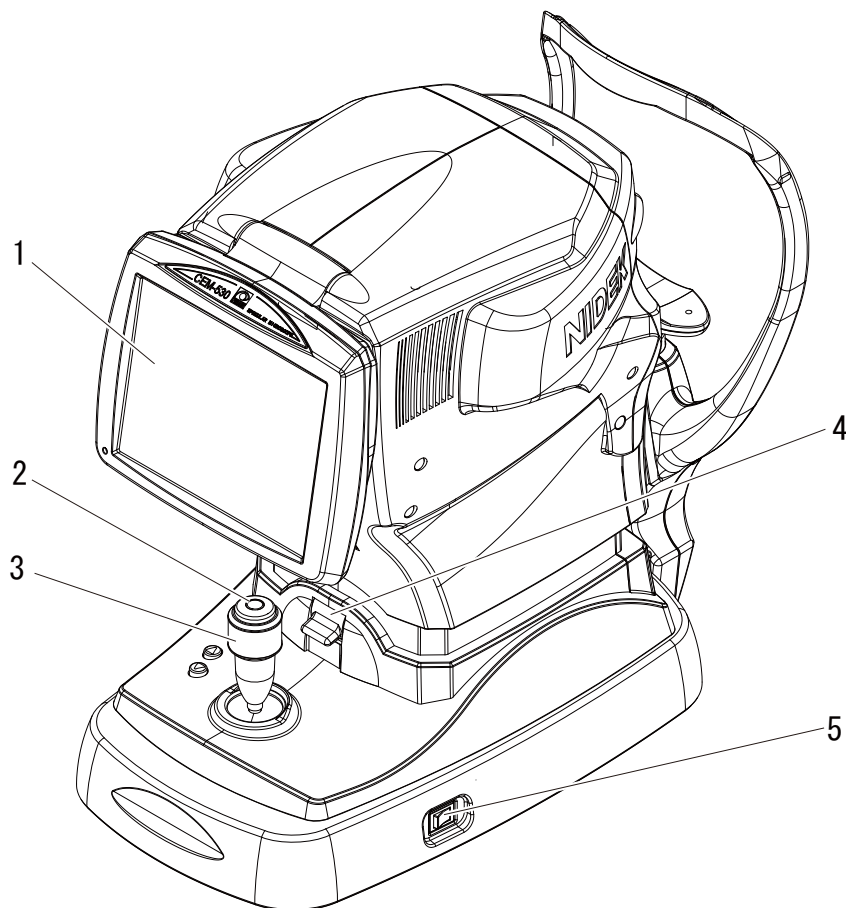
---

## 9 SUPPLEMENT

---

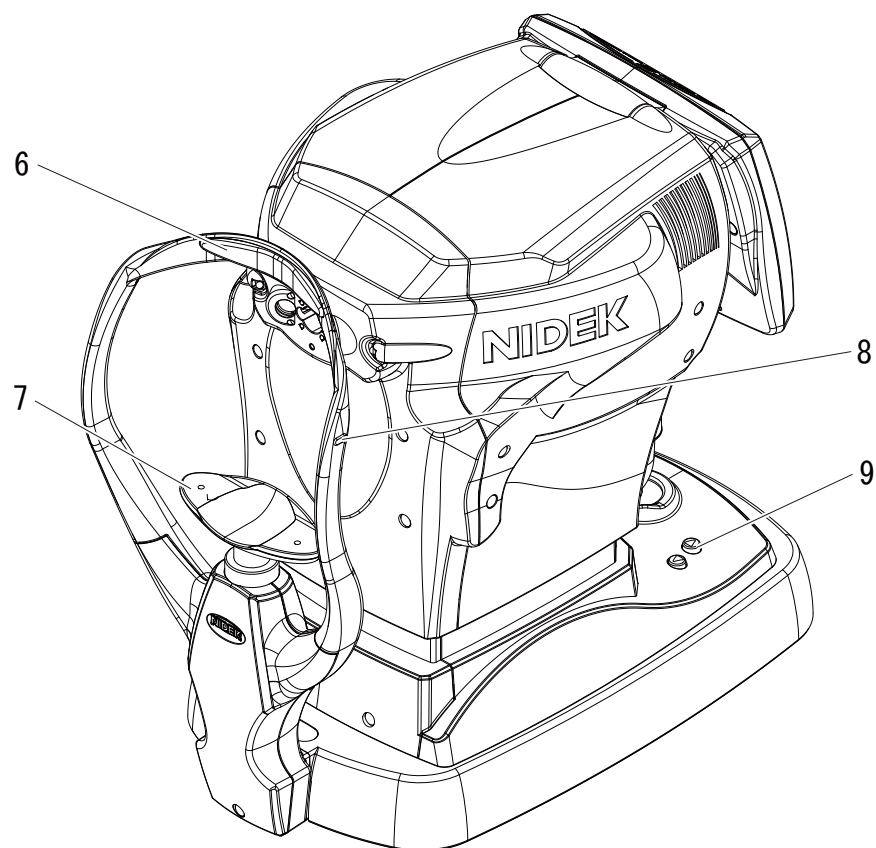
### 9.1 Configuration

#### 9.1.1 Front view



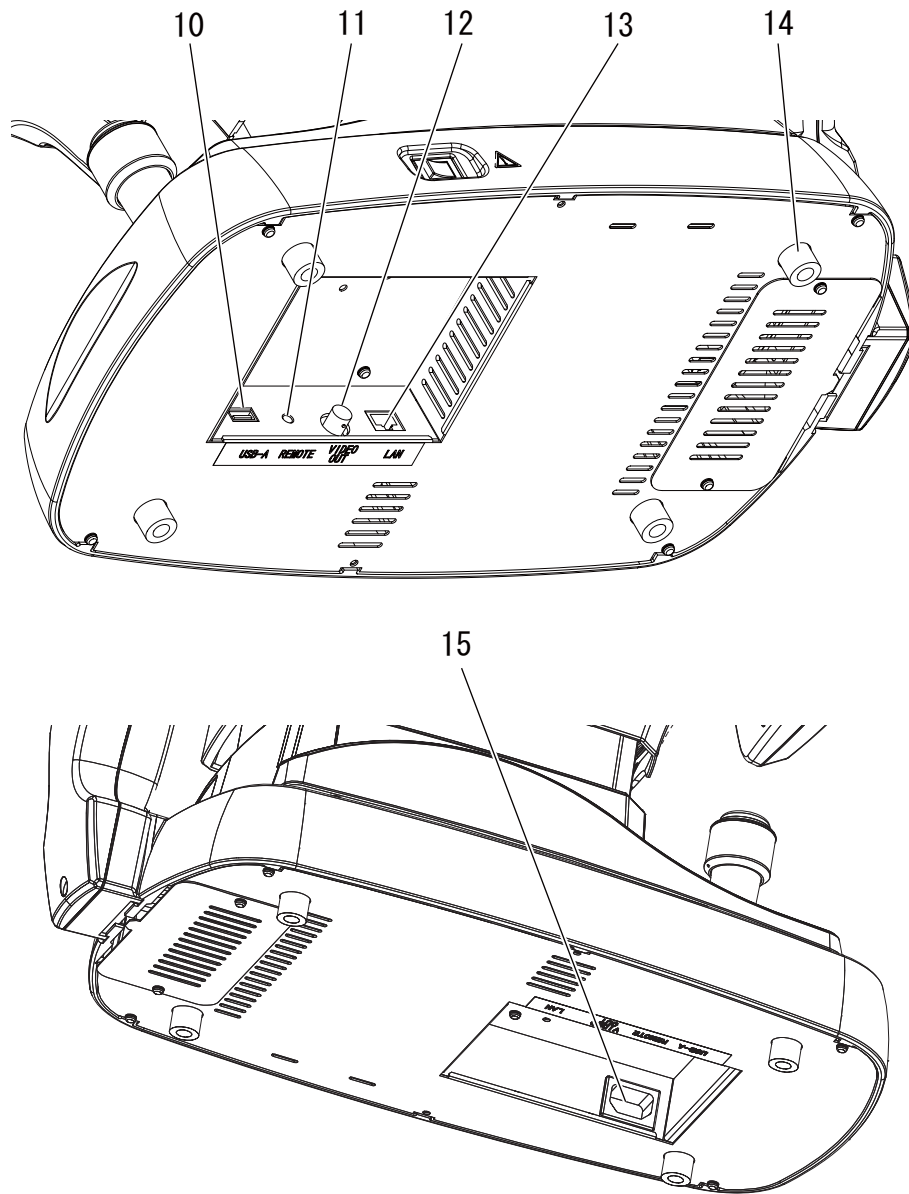
- 1 . Screen touch panel
- 2 . Start button
- 3 . Joystick
- 4 . Locking lever
- 5 . Power switch

## 9.1.2 Rear view



- 6 . Forehead rest
- 7 . Chinrest
- 8 . Eye level marker
- 9 . Chinrest up and down buttons

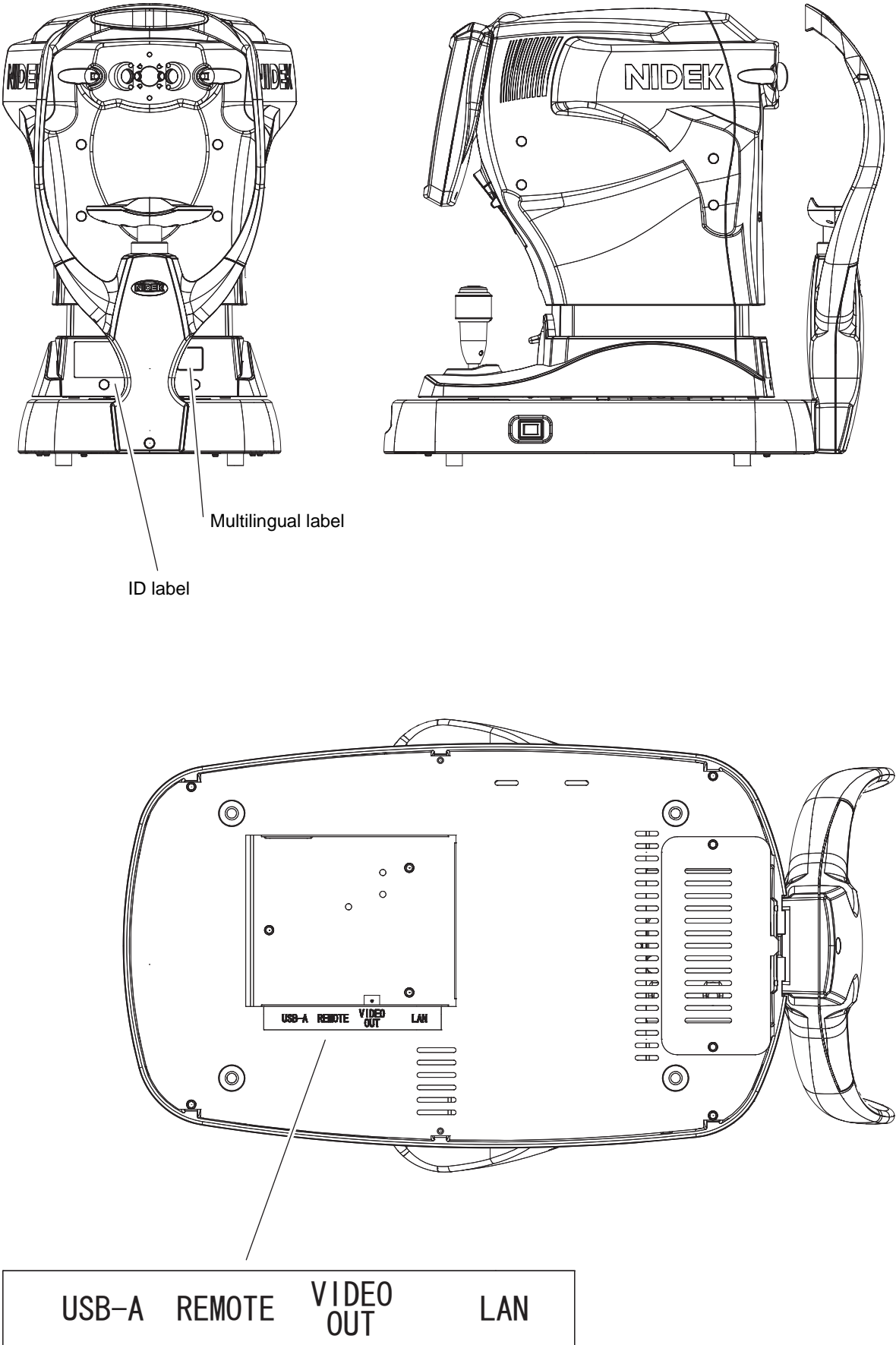
### 9.1.3 Bottom view



- 10. USB-A connector
- 11. REMOTE connector
- 12. VIDEO OUT connector
- 13. LAN connector
- 14. Sleeves for installation on system table
- 15. Power inlet












## 9.2 Labels

\* For the details of the ID label, see the next page.

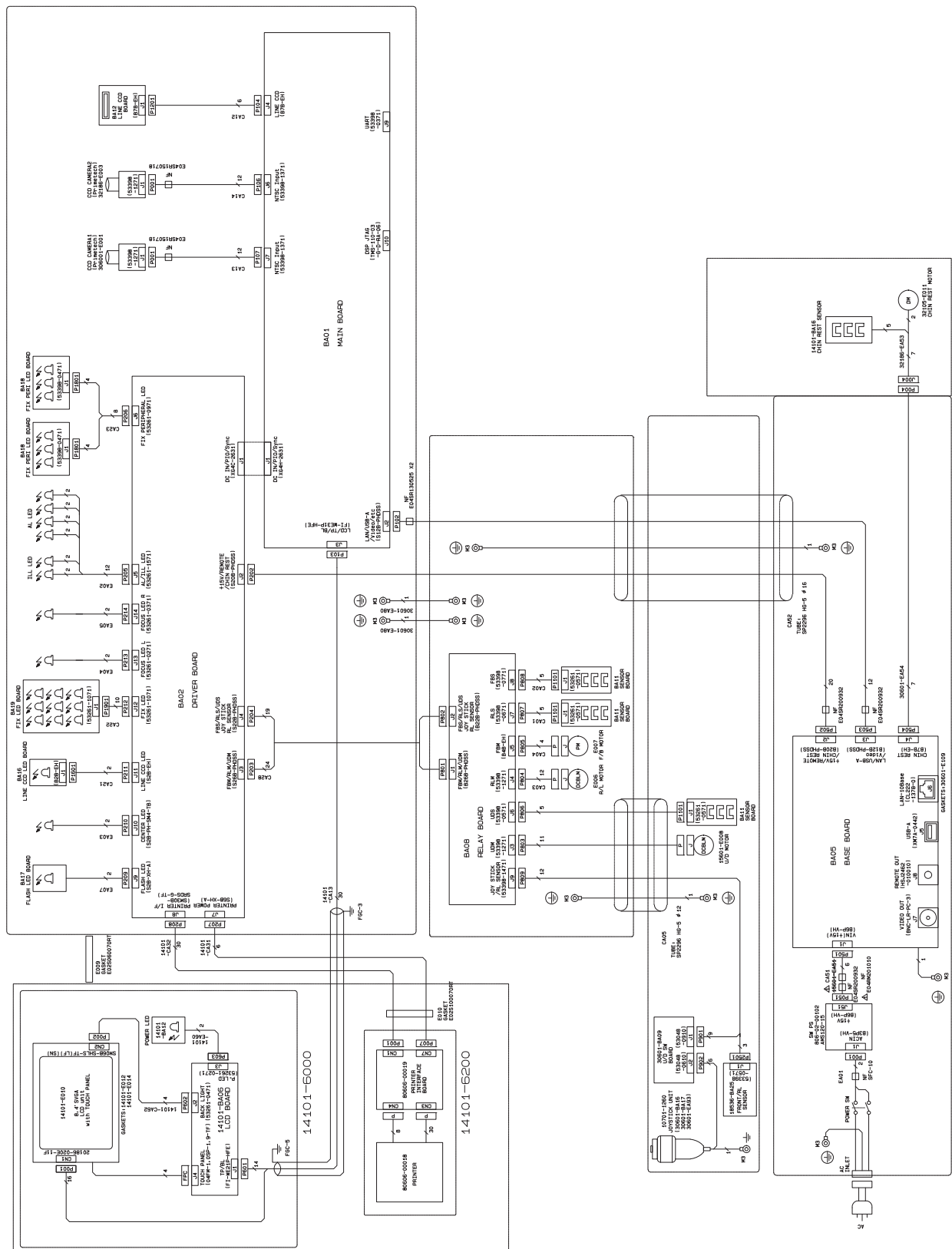




## ID label list

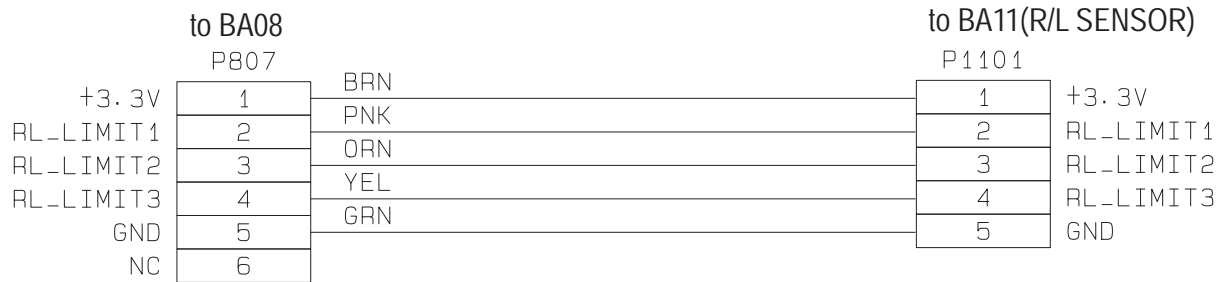
Destination	Label
Outside Japan	 <b>CEM - 530</b> SPECULAR MICROSCOPE <hr/> <b>INPUT</b>  100-240V ~ 50/60Hz 100VA <hr/> <b>SER.NO.</b> 14NNNN  XXXX <hr/>  <b>NIDEK co., LTD.</b> 34-14 MAEHAMA HIROISHI-CHO GAMAGORI AICHI JAPAN   0123  <hr/> MADE IN JAPAN 15201-M804-A
N. Inc.	 <b>CEM - 530</b> SPECULAR MICROSCOPE <hr/> <b>INPUT</b>  100-240V ~ 50/60Hz 100VA <hr/> <b>SER.NO.</b> 12NNNN  XXXX <hr/> Manufactured for NIDEK Incorporated 47651 Westinghouse Drive Fremont CA 94539 U.S.A. CAUTION : U.S.Federal Law restricts this device to sale,distribution, and use by or on the order of a licensed eye care practitioner.  <hr/> MADE IN JAPAN 15201-M802-A
Multilingual label	<div>             ENDOTHEL-MIKROSKOP              MICROSCOPE SPECULAIRE              MICROSCOPIO ESPECULAR              MICROSCOPIO SPECULARE           </div> <div>15201-M810-A</div>

## 9.3 Wiring Diagram

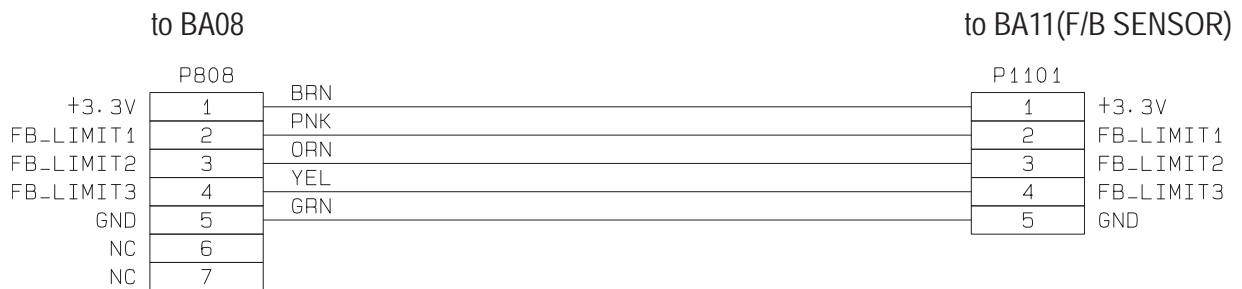


## 9.4 Connector Cable

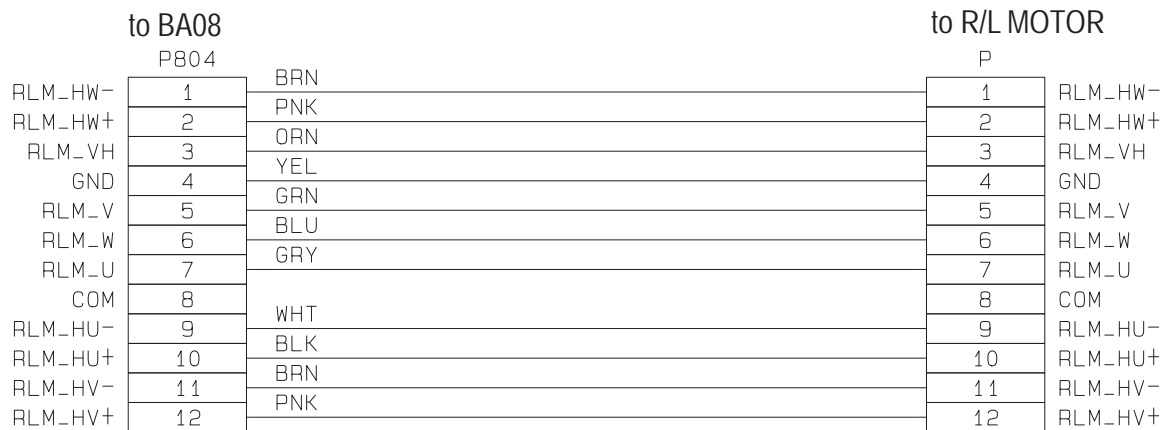
### 15201-CA01



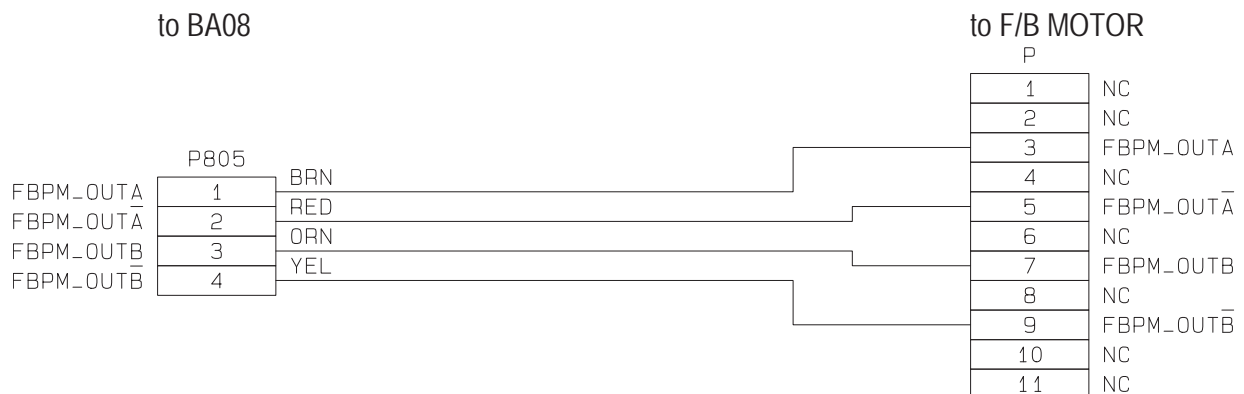
### 15201-CA02



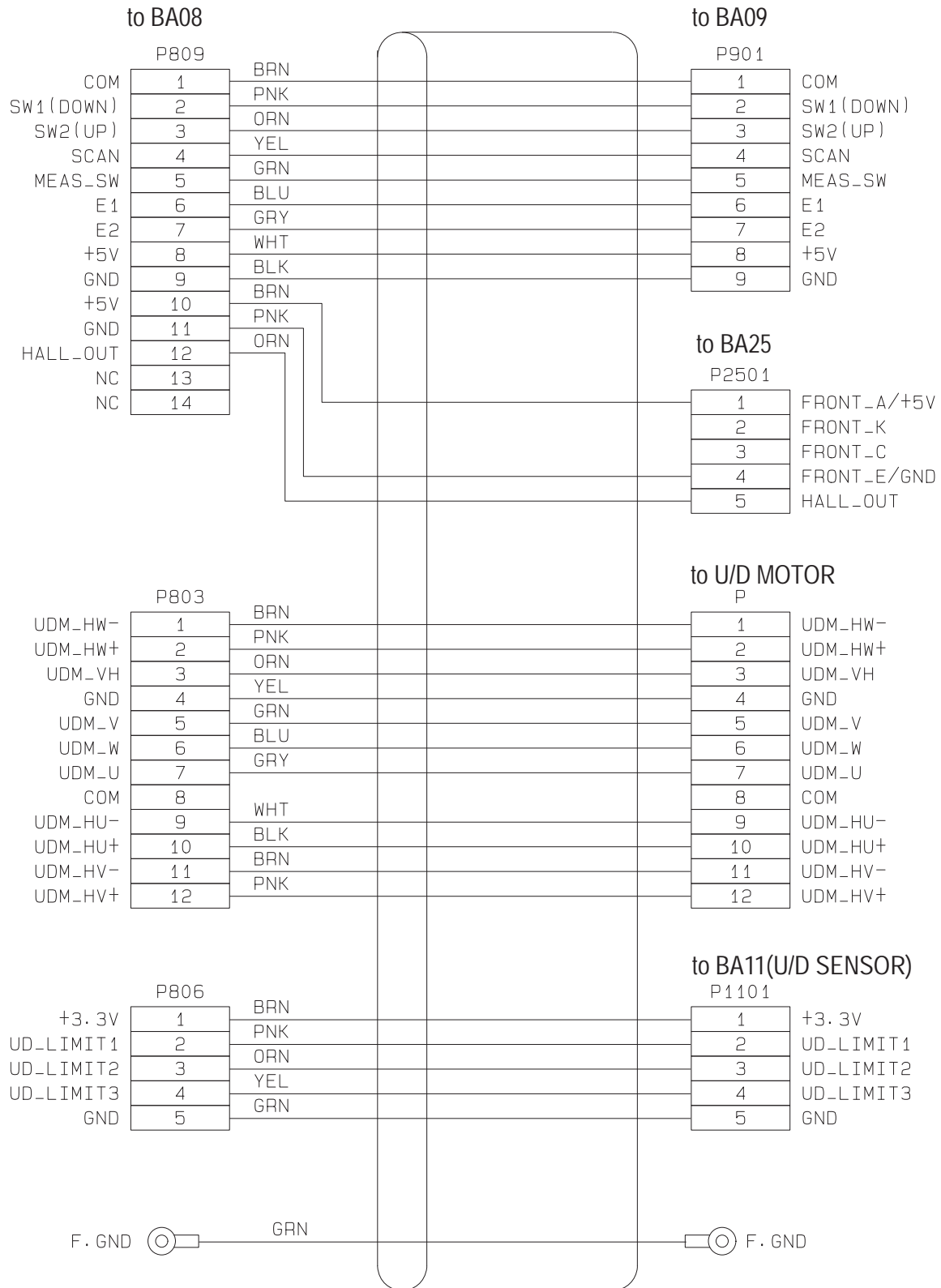
### 15201-CA03

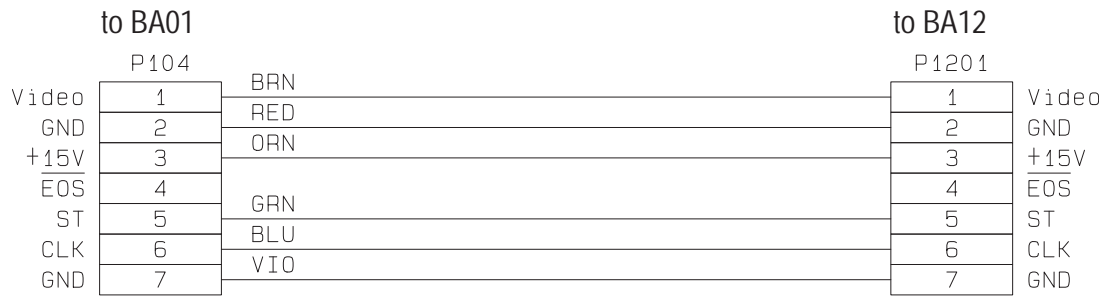
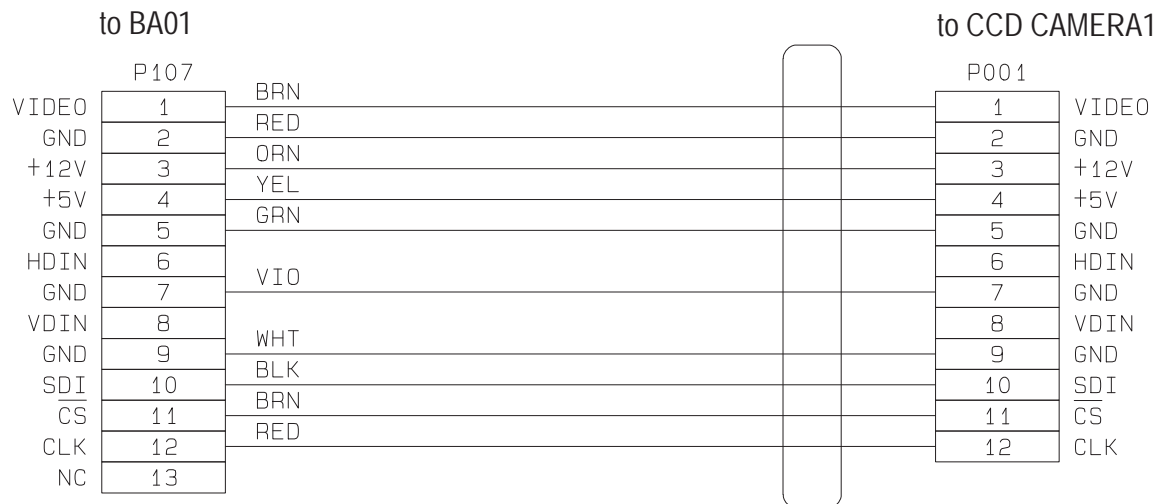
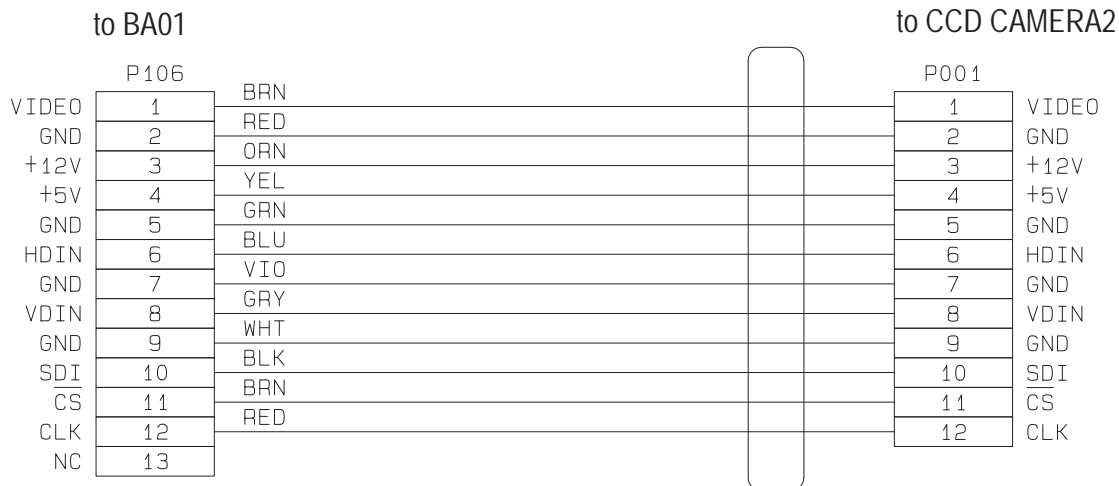
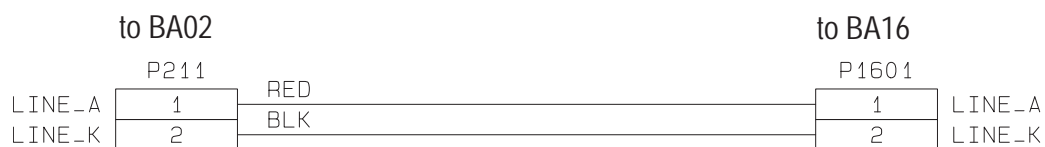


### 15201-CA04

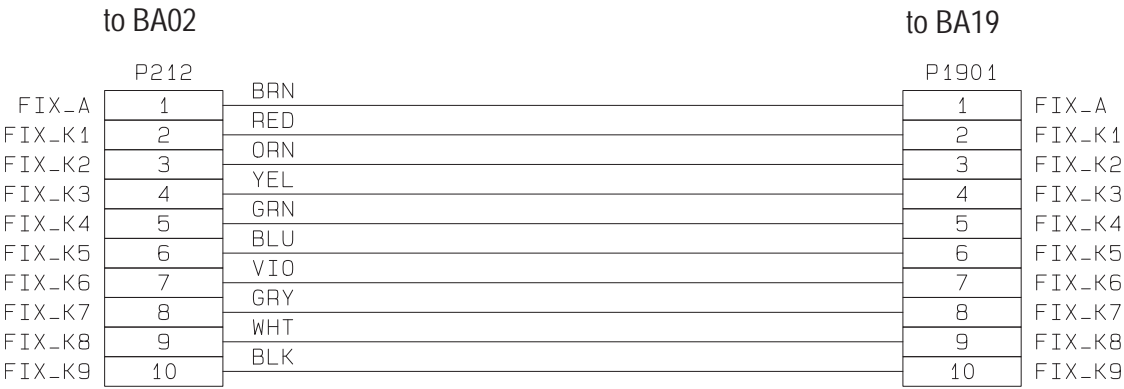


## 15201-CA05

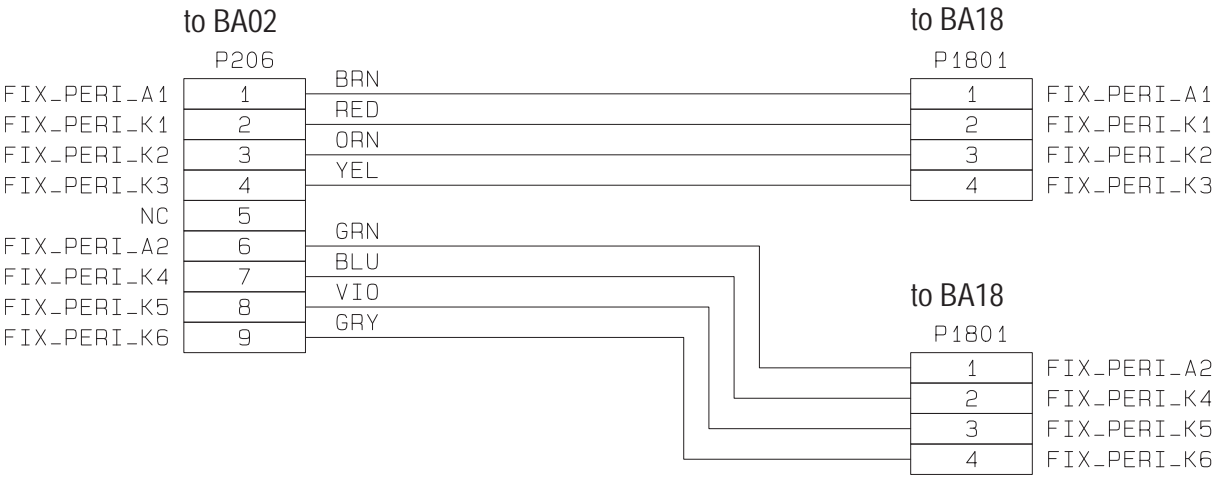


**15201-CA12****15201-CA13****15201-CA14****15201-CA21**

15201-CA22



15201-CA23



## 15201-CA28

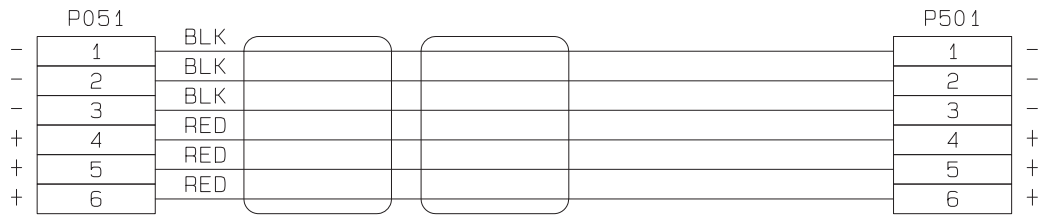
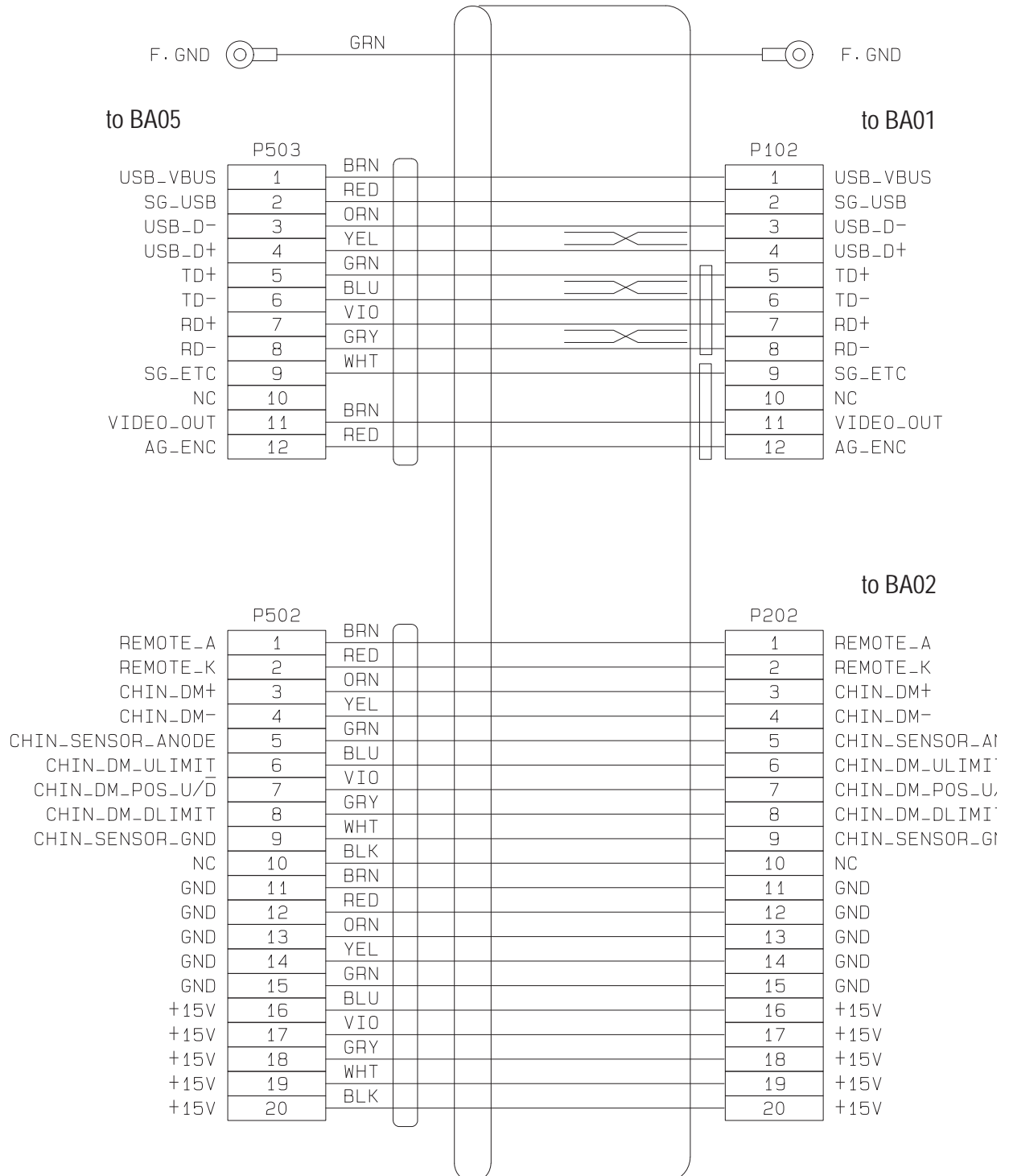
to BA02			to BA08		
	P203		P801		
FBPM_OUTA	1	BRN	1	FBPM_OUTA	
FBPM_OUTA	2	RED	2	FBPM_OUTA	
FBPM_OUTB	3	ORN	3	FBPM_OUTB	
FBPM_OUTB	4	YEL	4	FBPM_OUTB	
RLM_HV+	5	GRN	5	RLM_HV+	
RLM_HV-	6	BLU	6	RLM_HV-	
RLM_HU+	7	VIO	7	RLM_HU+	
RLM_HU-	8	GRY	8	RLM_HU-	
RLM_U	9	WHT	9	RLM_U	
NC	10		10	NC	
RLM_W	11	BRN	11	RLM_W	
NC	12		12	NC	
RLM_V	13	ORN	13	RLM_V	
GND	14	YEL	14	GND	
VH	15	GRN	15	VH	
RLM_HW+	16	BLU	16	RLM_HW+	
RLM_HW-	17	VIO	17	RLM_HW-	
UDM_HV+	18	GRY	18	UDM_HV+	
UDM_HV-	19	WHT	19	UDM_HV-	
UDM_HU+	20	BLK	20	UDM_HU+	
UDM_HU-	21	BRN	21	UDM_HU-	
UDM_U	22	RED	22	UDM_U	
UDM_W	23	ORN	23	UDM_W	
UDM_V	24	YEL	24	UDM_V	
UDM_HW+	25	GRN	25	UDM_HW+	
UDM_HW-	26	BLU	26	UDM_HW-	

P204			P802		
+3.3V	1	BRN	1	+3.3V	
GND	2	RED	2	GND	
UD_LIMIT1	3	ORN	3	UD_LIMIT1	
UD_LIMIT2	4	YEL	4	UD_LIMIT2	
UD_LIMIT3	5	GRN	5	UD_LIMIT3	
RL_LIMIT1	6	BLU	6	RL_LIMIT1	
RL_LIMIT2	7	VIO	7	RL_LIMIT2	
RL_LIMIT3	8	GRY	8	RL_LIMIT3	
FB_LIMIT1	9	WHT	9	FB_LIMIT1	
FB_LIMIT2	10	BLK	10	FB_LIMIT2	
FB_LIMIT3	11	BRN	11	FB_LIMIT3	
SW1(DOWN)	12	RED	12	SW1(DOWN)	
SW2(UP)	13	ORN	13	SW2(UP)	
MEAS_SW	14	YEL	14	MEAS_SW	
E1	15	GRN	15	E1	
E2	16	BLU	16	E2	
+5V	17	VIO	17	+5V	
GND	18	GRY	18	GND	
HALL_OUT	19	WHT	19	HALL_OUT	
NC	20		20	NC	
NC	21		21	NC	
NC	22		22	NC	

**15201-CA51**

to SW PS

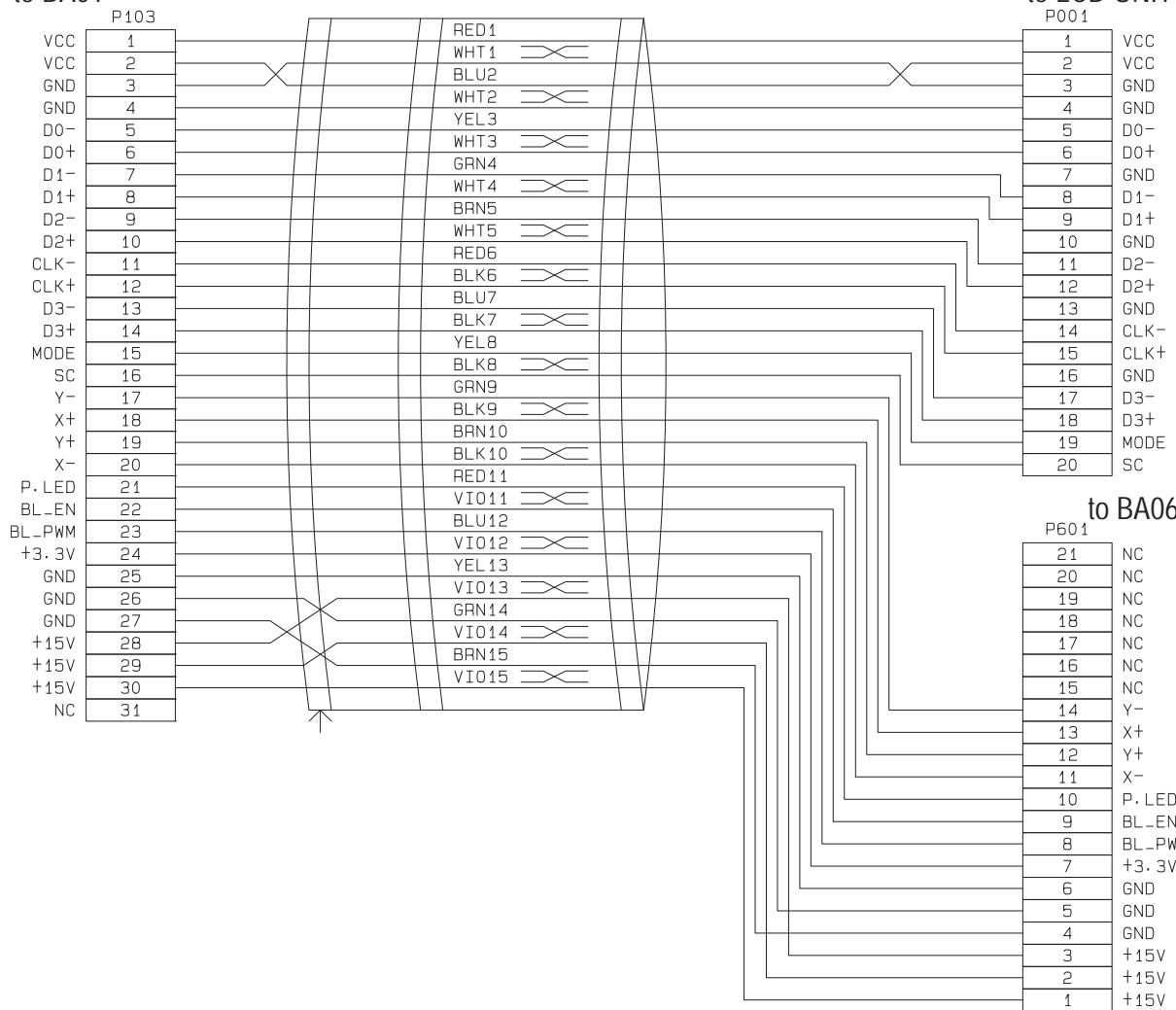
to BA05

**15201-CA52**



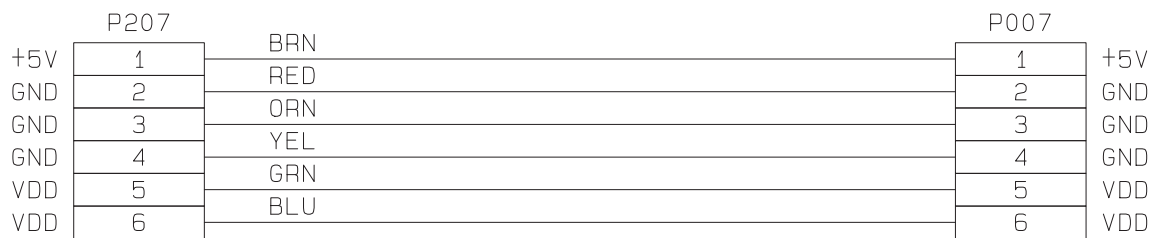
## 14101-CA13

to BA01



## 14101-CA31

to BA02



**14101-CA32**

to BA02

to PRINTER INTERFACE BOARD

	P208		P001	
PRSTB	1	BRN	1	PRSTB
GND	2	RED	2	GND
PRDT0	3	ORN	3	PRDT0
GND	4	YEL	4	GND
PRDT1	5	GRN	5	PRDT1
GND	6	BLU	6	GND
PRDT2	7	VIO	7	PRDT2
GND	8	GRY	8	GND
PRDT3	9	WHT	9	PRDT3
GND	10	BLK	10	GND
PRDT4	11	BRN	11	PRDT4
GND	12	RED	12	GND
PRDT5	13	ORN	13	PRDT5
GND	14	YEL	14	GND
PRDT6	15	GRN	15	PRDT6
GND	16	BLU	16	GND
PRDT7	17	VIO	17	PRDT7
GND	18	GRY	18	GND
ACKNLG	19	WHT	19	ACKNLG
GND	20	BLK	20	GND
BUSY	21	BRN	21	BUSY
GND	22	RED	22	GND
RINF2	23	ORN	23	RINF2
GND	24	YEL	24	GND
SLCTIN	25	GRN	25	SLCTIN
INPRM	26	BLU	26	INPRM
RINF1	27	VIO	27	RINF1
RINF3	28	GRY	28	RINF3
ATF	29	WHT	29	ATF
GND	30	BLK	30	GND

**14101-CA62**

to BA06

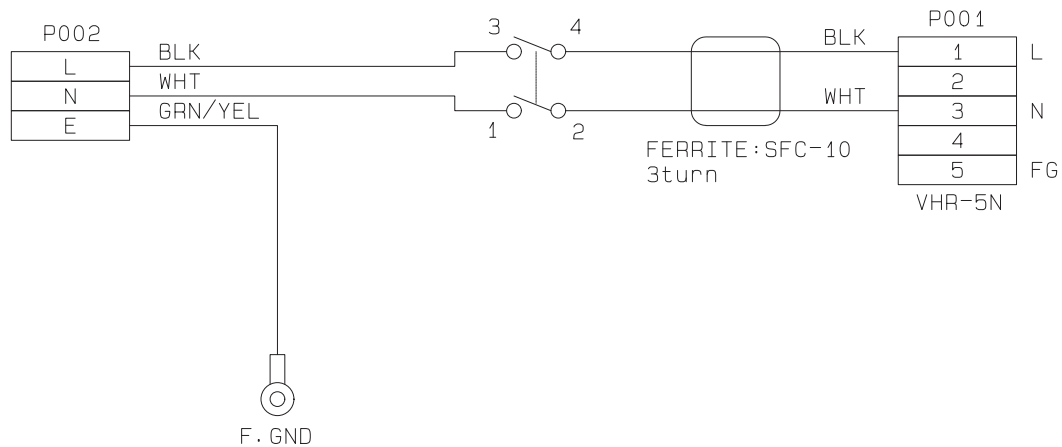
to LCD UNIT

	P602		P002	
LED_C1	1	BRN	1	NC
LED_A1	2	RED	2	NC
LED_A2	3	ORN	3	LED_C1
LED_C2	4	YEL	4	LED_A1
			5	LED_A2
			6	LED_C2

## 15201-EA01

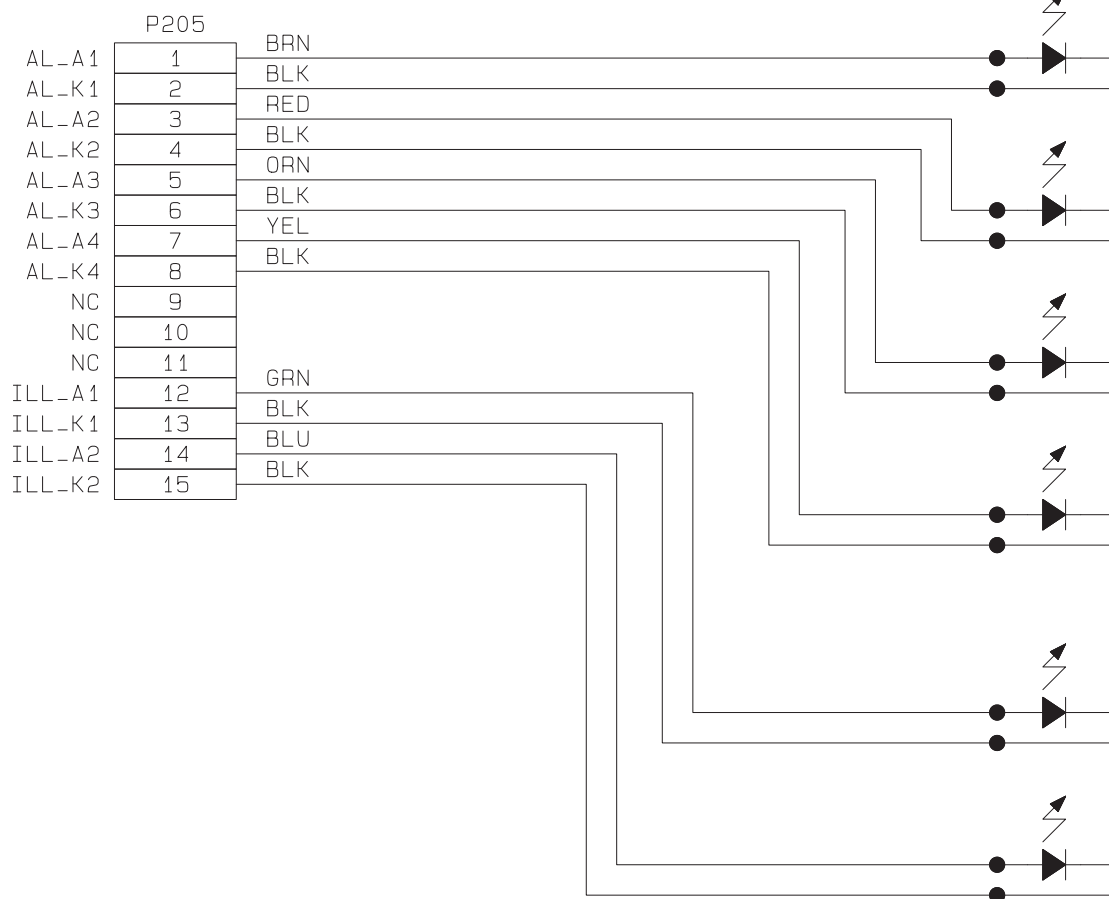
to POWER CABLE

to PS



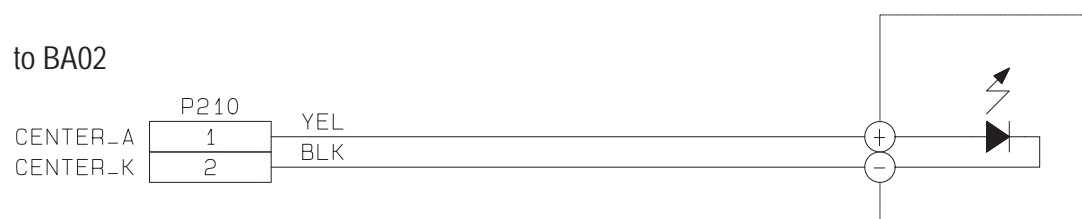
## 15201-EA02

to BA02



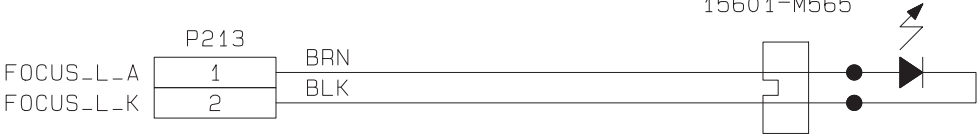
## 15201-EA03

to BA02



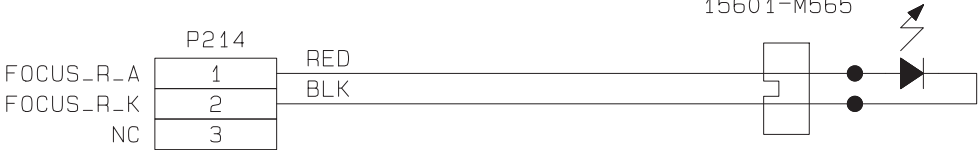
15201-EA04

to BA02



15201-EA05

to BA02



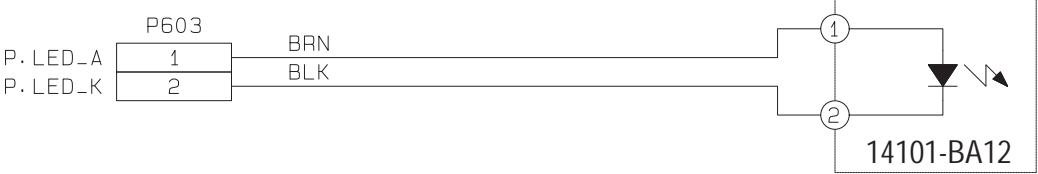
15201-EA07

to BA02



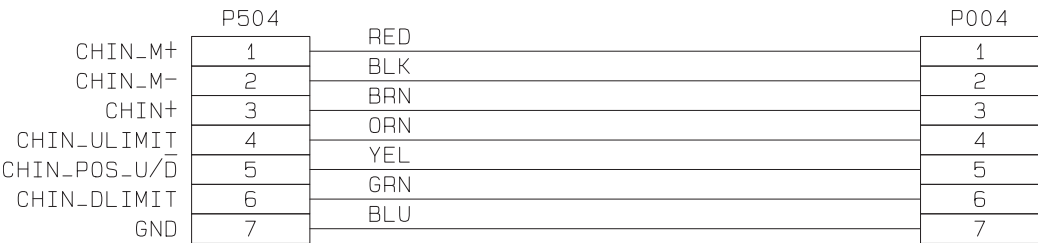
14101-EA60

to BA06



30601-EA54

to BA05

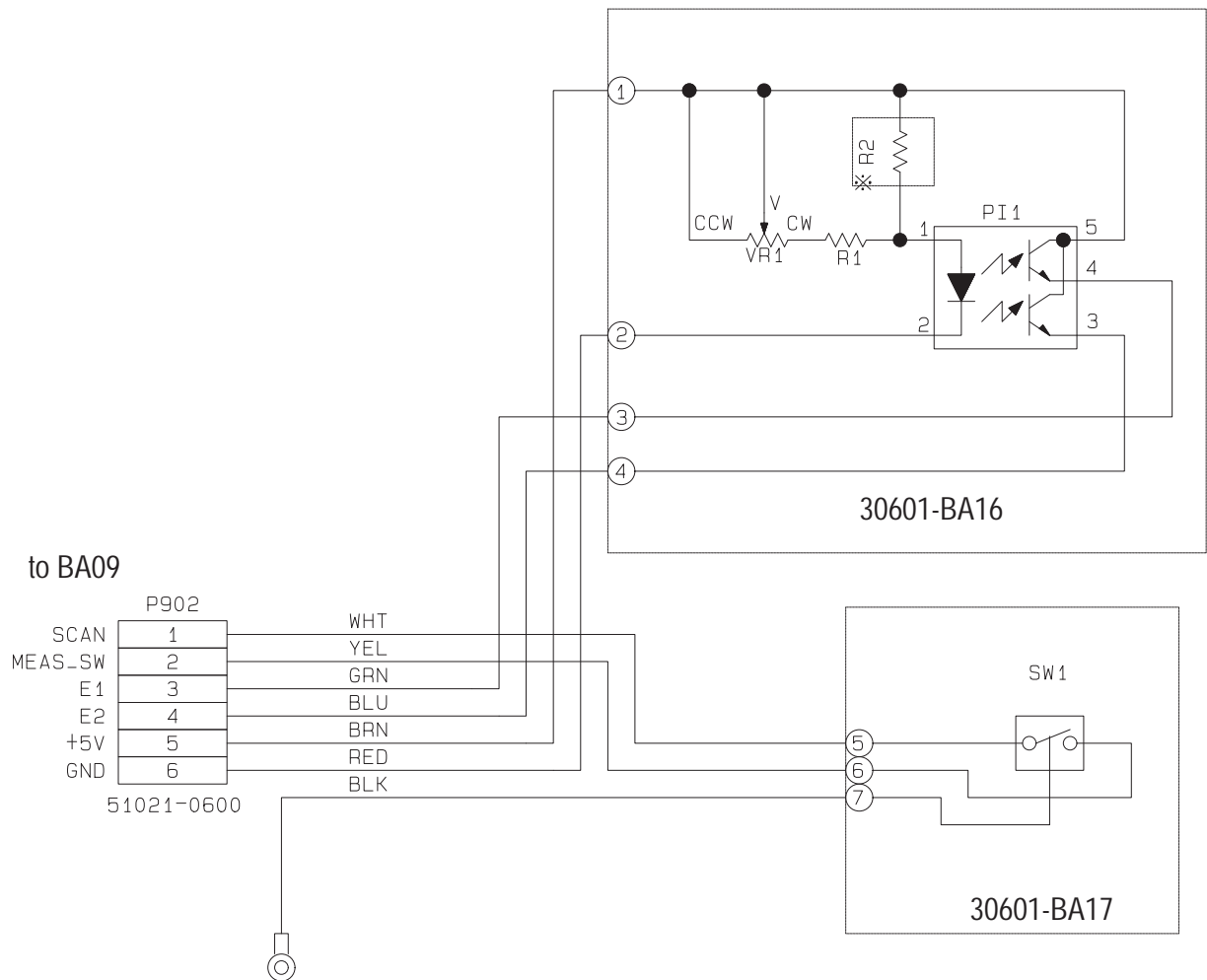


to CHIN REST

30601-EA80



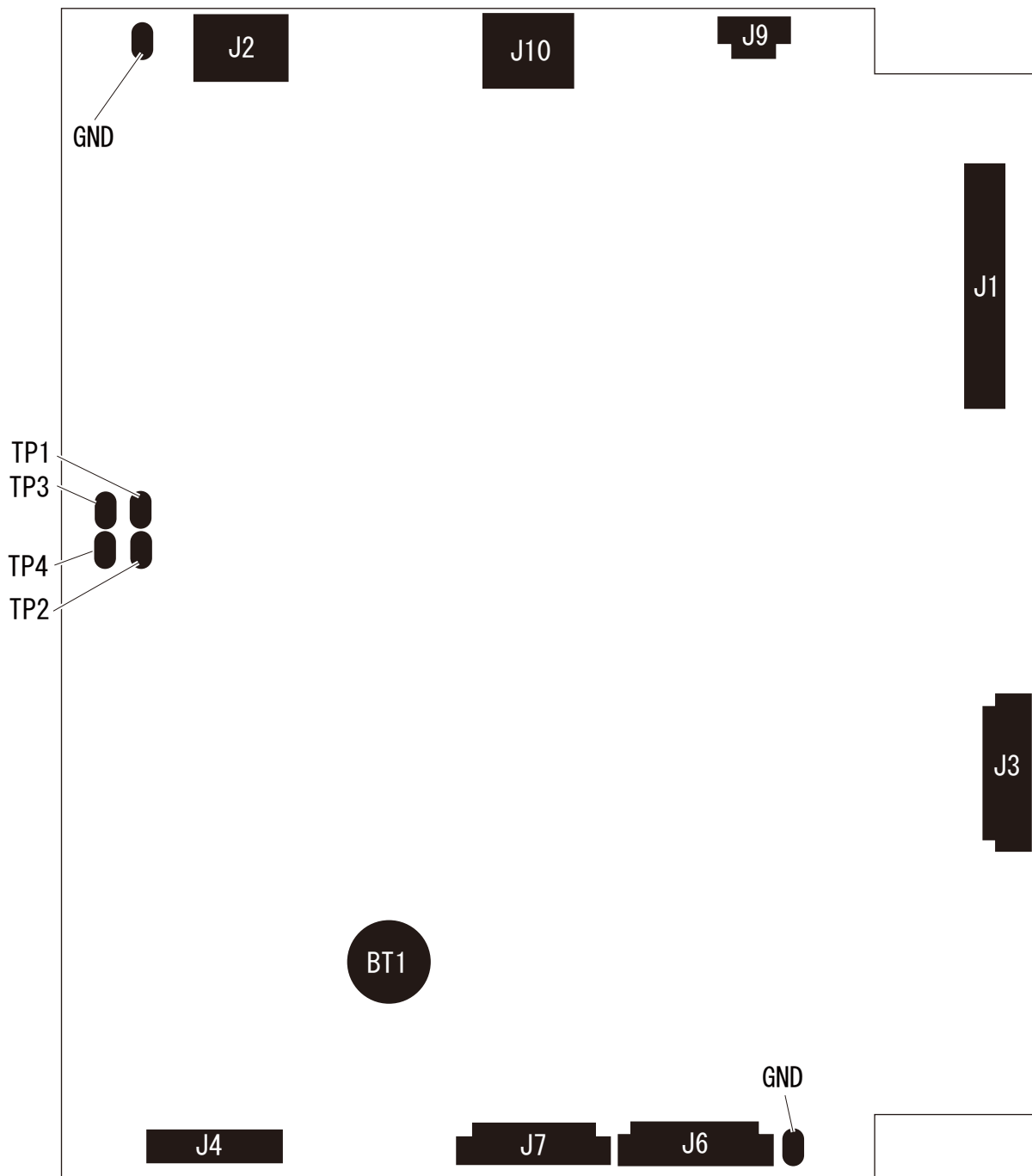
30601-EA93





## 9.5 Layout of Boards, Connectors, and Test Pins

### 9.5.1 15201-BA01



## 1 . Connector

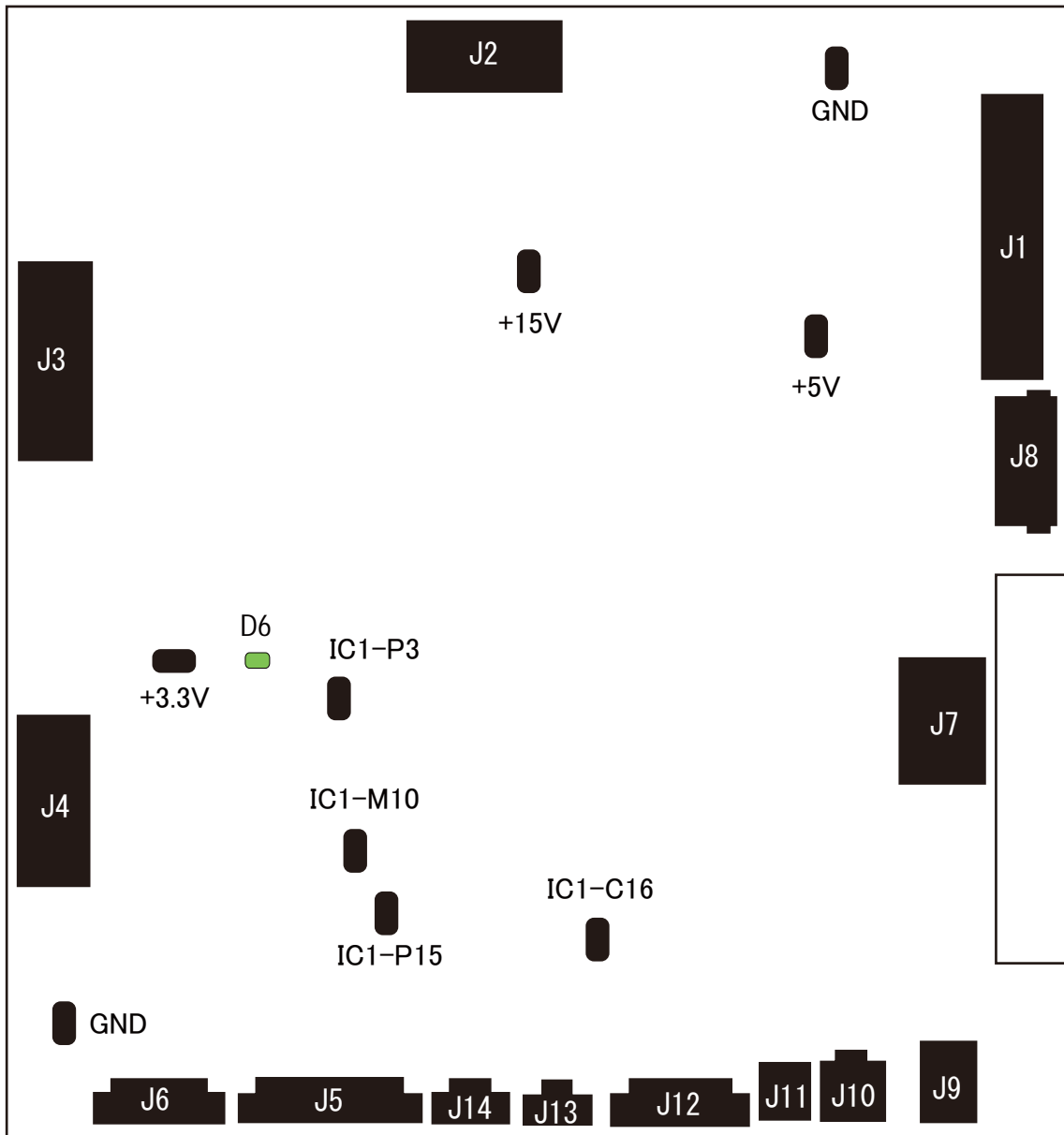
Connector No.	Connection item	Remarks
J1	(BA02-J1)	DRIVER BOARD
J2	15201-CA52(BA05-J3)	LAN USB VIDEO
J3	14101-CA13 (BA06-J1, LCD-CN1)	LCD
J4	15201-CA12 (BA12-J1)	LINE CCD
J5	—	—
J6	15201-CA14 (32186E003-J1)	CCD CAMERA 2
J7	15201-CA13 (30601E001-J1)	CCD CAMERA 1
J8	—	—
J9	Open	
J10	Open	

## 2 . TP

Serigraph	Signal	Intended use
TP1	—	—
TP2	—	—
TP3	—	—
TP4	—	—
GND	—	—



## 9.5.2 15201-BA02



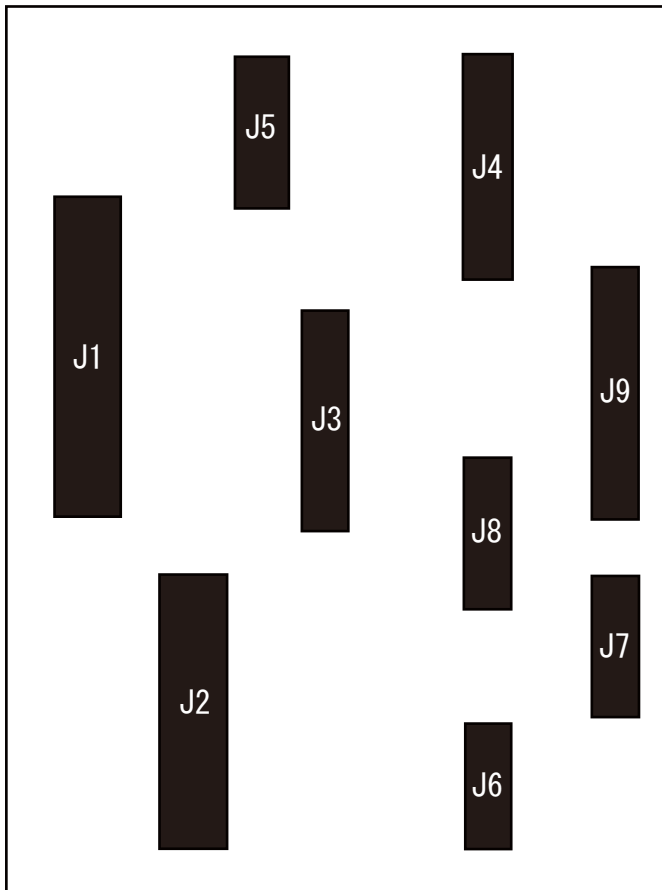
## 1 . Connector

Connector No.	Connection item	Remarks
J1	(BA01-J1)	MAIN BOARD
J2	15201-CA52 (BA05-J2)	+15 V REMOTE CHINREST
J3	15201-CA28 (BA08-J1,J2)	MOTOR DRIVE
J4		SENSOR SIGNAL
J5	15201-EA02	AL/ILL LED
J6	15201-CA23(BA18-J1)	EXTERNAL FIX LED
J7	14101-CA31 (Printer I/F board)	PRINTER
J8	14101-CA32(Printer I/F board)	
J9	15201-EA07	FLASH LED
J10	15201-EA03	CENTER LED
J11	15201-CA21 (BA16-J1)	LINE CCD LED
J12	15201-CA22 (BA19-J1)	INNER FIX LED
J13	15201-EA04	FOCUS LED L
J14	15201-EA05	FOCUS LED R

## 2 . TP

Serigraph	Signal	Intended use
+3.3 V	+3.3 V	Voltage check
+5 V	+5 V	
+15 V	+15 V	
GND	GND	
IC1-C16	—	—
IC1-P3	—	—
IC1-M10	—	—
IC1-P15	—	—

### 9.5.3 15201-BA08



#### 1 . Connector

Connector No.	Connection item	Remarks
J1	15201-CA28(BA02-J3, J4)	MOTOR DRIVE
J2		SENSOR SIGNAL
J3	15201-CA05 (15601-E008)	U/D MOTOR
J4	15201-CA03 (15201-E006)	R/L MOTOR
J5	15201-CA04 (15201-E007)	F/B MOTOR
J6	15201-CA05 (BA11-J1)	U/D SENSOR
J7	15201-CA01 (BA11 [R/L]-J1)	R/L SENSOR
J8	15201-CA02 (BA11 [F/B]-J1)	F/B SENSOR
J9	15201-CA05 (30601BA09-J1), (18536BA25-J1)	JOY STICK CHINREST U/D SWITCH R/L SENSOR

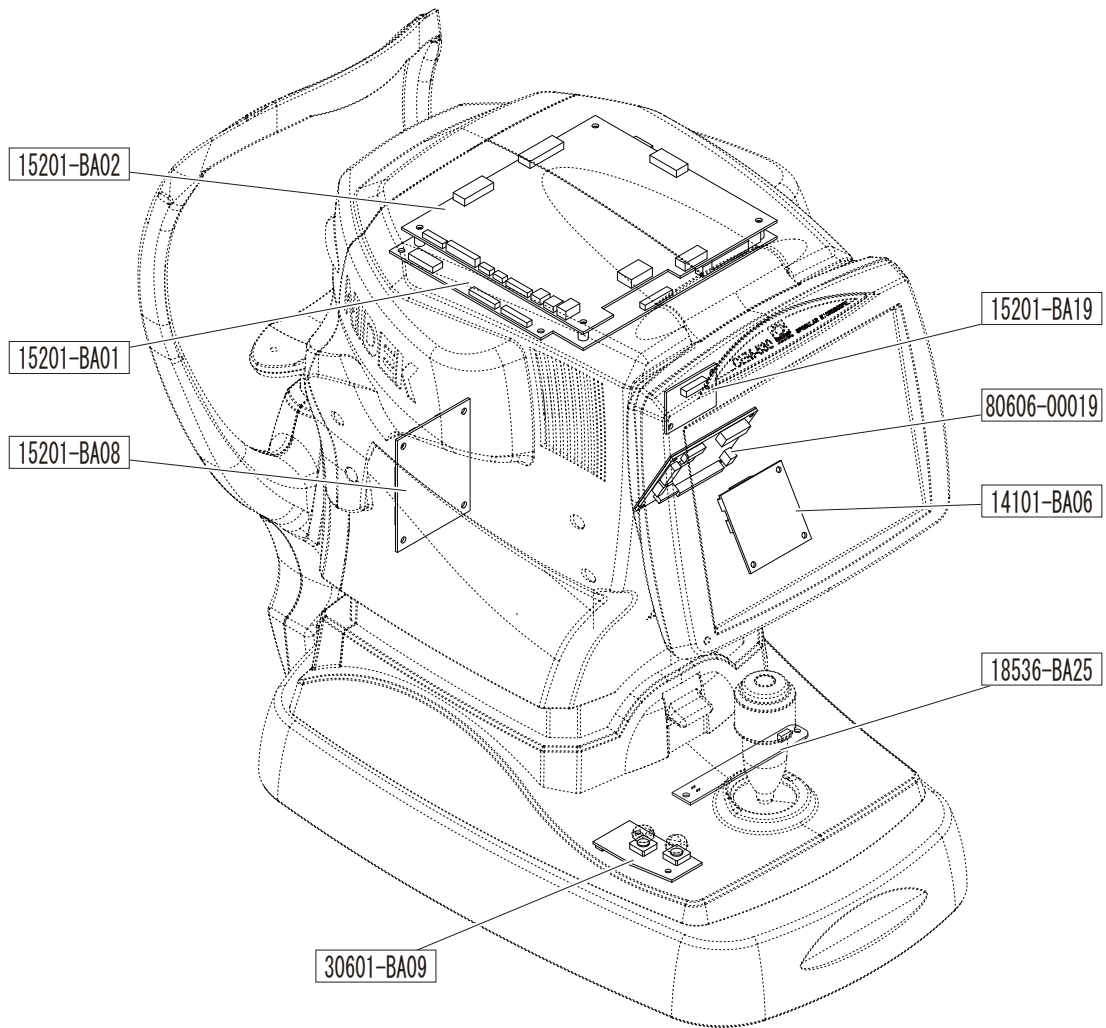
## 9.6 Error Message List

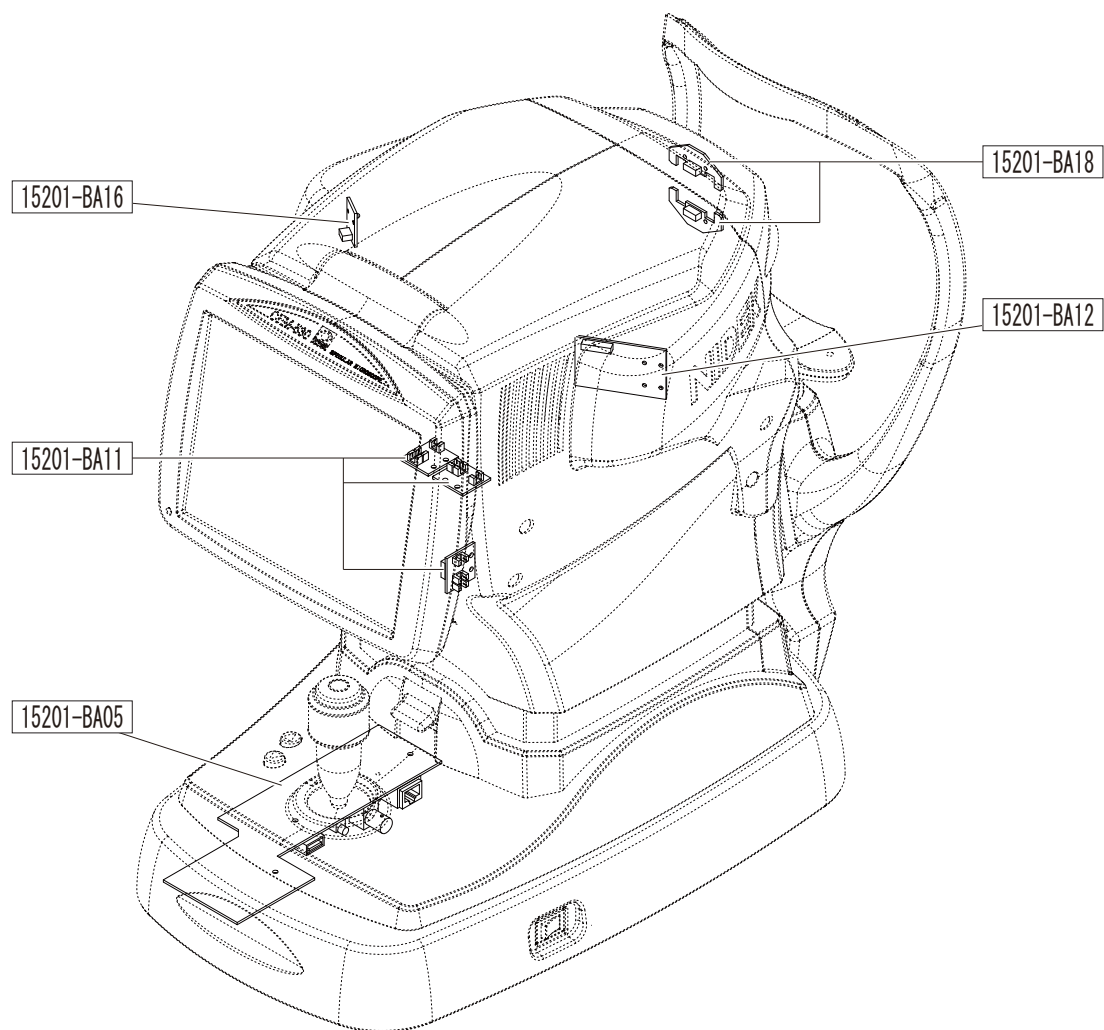
Code	Error message	Symptom	Cause	Remedy
001	EEPROM Error.	Data saved in EEPROM is abnormal.	EEPROM failure	Replace BA01 (see 7.2.1 [p90]).
			EEPROM data corruption	Recover EEPROM data.
002	Clock Error.	Clock IC setting is initialized.	Backup battery for clock IC is drained.	Charge the backup battery for timer IC. Reset the time (see 8.6.5 [p260]).
031	U/D Motor Error.	U/D motor does not operate.	U/D motor failure Cable breakage	Replace the U/D motor unit (see 7.3.5 [p111]).
			U/D motor driver failure	Replace BA02 (see 7.2.2 [p92]).
		Sensor detection failure Operation timeout	Failure or cable breakage of U/D limit sensor or position sensor	Replace the U/D limit sensor or position sensor (see 7.2.7 [p97]).
			Detection failure due to the deformation of shading plate for U/D limit sensor	Replace the shading plate for U/D limit sensor.
032	R/L Motor Error.	R/L motor does not operate.	Failure or cable breakage of R/L motor	Replace R/L motor ASSY (see 7.1.3 [p80]). Replace R/L motor unit (see 7.3.3 [p107]).
			Failure of R/L motor driver	Replace BA02 (see 7.2.2 [p92]).
		Sensor detection failure Operation timeout	Failure or cable breakage of R/L limit sensor or position sensor	Replace the R/L limit sensor or position sensor (see 7.2.5 [p95]).
			Detection failure due to the deformation of shading plate for R/L limit sensor	Replace the shading plate for R/L limit sensor.
033	F/B Motor Error.	F/B motor does not operate.	Failure or cable breakage of F/B motor	Replace F/B motor unit (see 7.3.4 [p108]).
			Failure of F/B motor driver	Replace BA02 (see 7.2.2 [p92]).
		Sensor detection error Operation timeout	Failure or cable breakage of F/B limit sensor or position sensor	Replace the F/B limit sensor or position sensor (see 7.2.6 [p96]).
			Detection failure due to the deformation of shading plate for F/B limit sensor	Replace the shading plate for F/B limit sensor.
043	Printer Error.	Printer does not operate.	Printer cable breakage	Check the internal printer (see 9.3 [p276]).
			Printer failure	Replace the internal printer (see 7.3.7 [p114]).
			Failure of printer interface board	Replace the printer interface board (see 7.3.8 [p116]).
			Failure of printer driver	Replace BA02 (see 7.2.2 [p92]).
601	USB Device Error.	USB device is not recognized.	USB device failure USB device is not suitable for the CEM-530.	Replace the USB device.
			Board failure	Replace BA01 (see 7.2.1 [p90]).
700	CIFS Error.		Network setting failure PC setting failure	Correct the PC network setting.
703	Hardware Error.		Board failure	Replace BA01 (see 7.2.1 [p90]).

Code	Error message	Symptom	Cause	Remedy
704	DHCP Error.	IP address cannot be obtained.	DHCP server is not found.	Check the DHCP server.
750	Can't Access Network	Network is not accessible.	LAN cable is disconnected.	Connect the LAN cable.
			Network setting is not correct.	Correct the network setting.
751	Can't Write File in PC.	Data cannot be written.	Shared folder is write-protected.	Correct the setting of the shared folder.
			Insufficient free space	Prepare free space.
754	There is no PC Name in this Network.	The PC with the set machine name does not exist.	LAN cable is disconnected.	Connect the LAN cable.
			Network setting is not correct.	Correct the network setting.
			Specified PC is not attached to the network.	Check the power source for the PC. Check the connection of the PC.
756	Can't Logon PC.	PC cannot be logged on.	User name or password is not correct.	Correct the user name or password.
757	There is no Shared Folder.	Shared folder is not found.	The shared folder name is not correct.	Correct the shared folder name.
			Specified folder is not set to be shared.	Correct the setting for the shared folder.
758	Network Timeout.	Timeout		Restart the operation after some time.
759	Can't Delete File in PC.	Data cannot be deleted.	Shared folder is write-protected.	Disable write protection.
760	Network Initializing. Please Retry.	Network is being initialized.	Setting after initialization takes some time.	Restart the operation after some time.
761	Access Denied.	PC is not accessible.	Access to shared folder in the destination PC is not authorized.	Reset the user name and password.
762	Account Disabled.	Account is invalid.	User setting is not correct.	Reset the user name and password.
763	Can't Read File in PC.	Data cannot be read.	Access to shared folder in the destination PC is not authorized.	Reset the user name and password.
766	File Name is same. Can't Write File in PC.	Data cannot be written.	Data saved in the shared folder in the destination PC has the same name.	Restart the operation after some time. (The name of the data changes.)
771	Network cable is not connected.	Network connection is not possible.	LAN cable is disconnected.	Connect the LAN cable.
			LAN cable breakage	Replace the LAN cable.
772	There is no response.	File is not deleted or renamed within the specified time.	Share file setting is improper.	Conform the share file setting to the software setting on the PC.

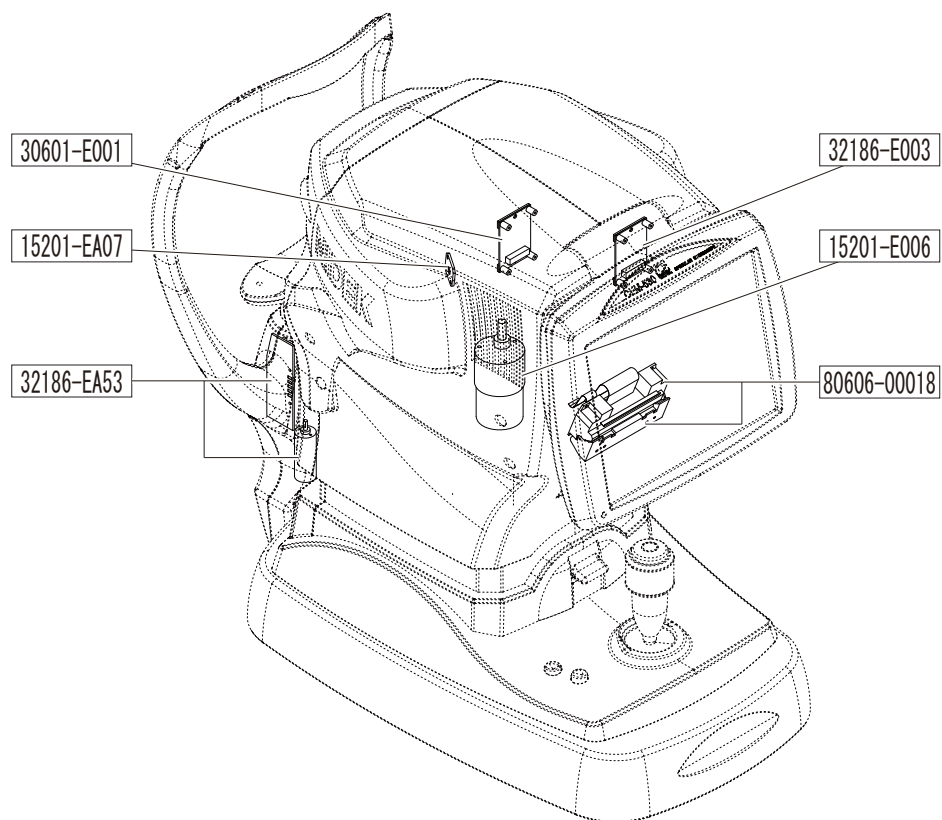
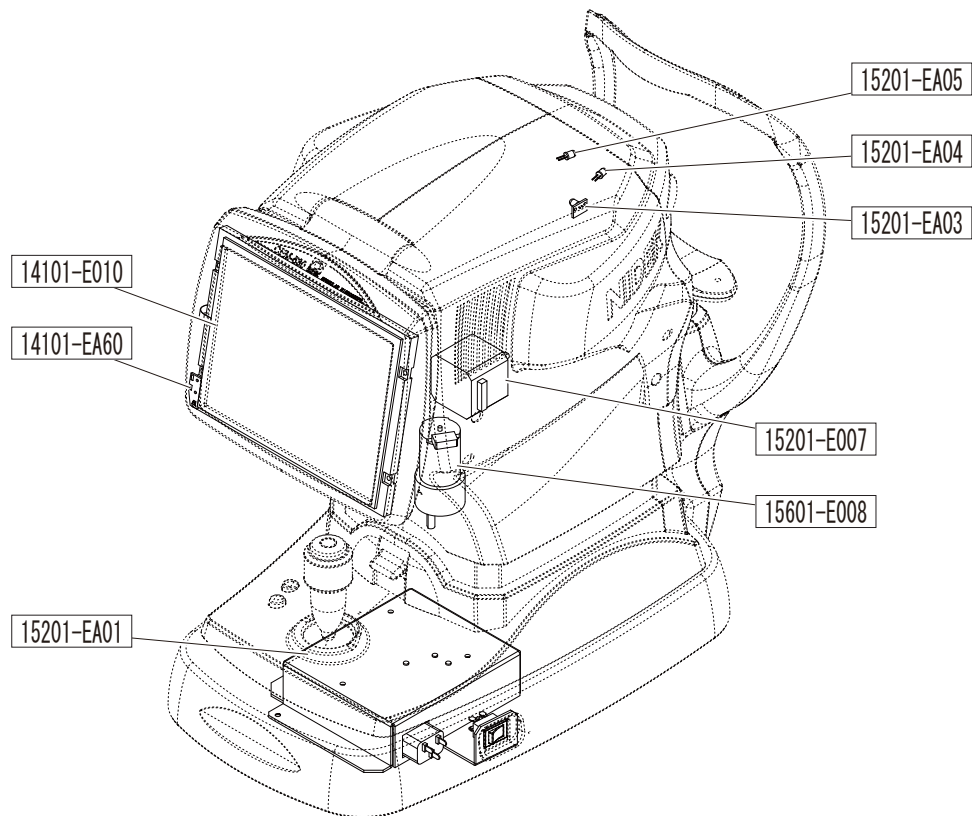
## 9.7 Parts Layout

### 9.7.1 Boards (BA\*\*)



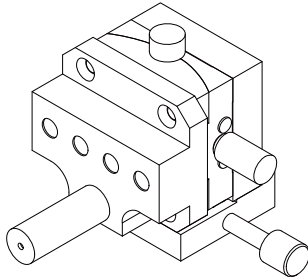
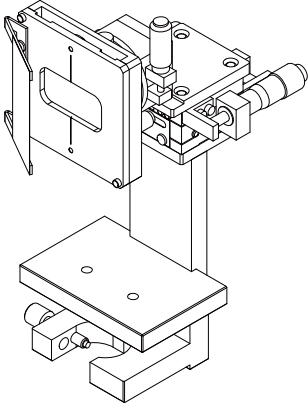
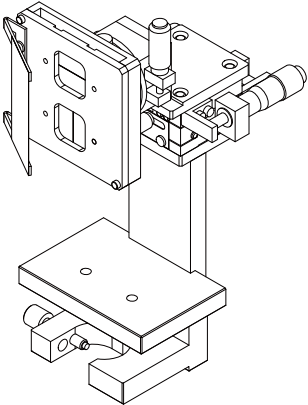
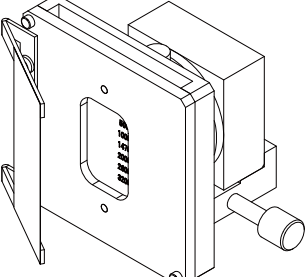


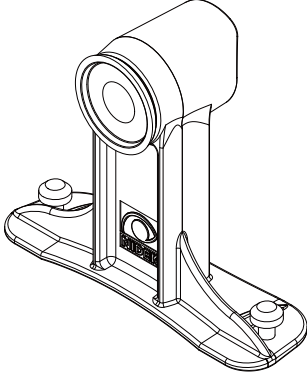
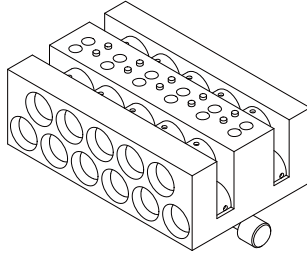
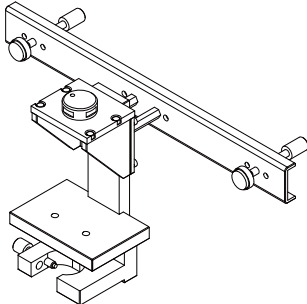
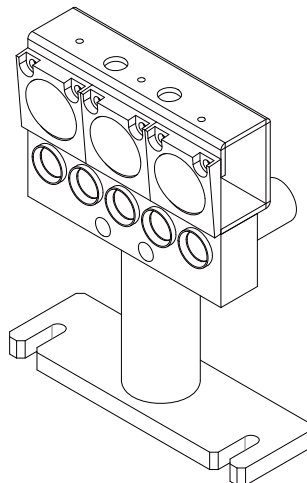
### 9.7.2 Cables and cable units (CA\*\*, EA\*\*)





## 9.8 Jig List

Parts No.	Name	Figure	Intended purpose	Related section
15275-1400	Calibration jig		Pachymetry accuracy check Pachymetry calibration	8.3.13 Pachymetry accuracy check (p203) 8.4.3 Pachy calibration (p222)
15275-1600	Resolution check jig		Endothelium measurement accuracy check	8.3.12 Endothelium measurement accuracy check (p176)
15275-1700	Ronchi-ruling check jig		Endothelium measurement accuracy check	8.3.12 Endothelium measurement accuracy check (p176)
15275-2100	Cell model eye jig		Endothelium measurement accuracy check Endothelium measurement calibration	8.3.12 Endothelium measurement accuracy check (p176) 8.4.2 Endo image calibration (p214)

32961-0500	Model eye (CL) unit		Auto tracking check Auto tracking adjustment	8.3.8 Tracking check (p162) 8.4.1 Tracking adjustment (p211)
32171-0600	22-model eye jig		Pachymetry calibration	8.4.3 Pachy calibration (p222)
32188-1100	Chinrest attachment jig		Pachymetry accuracy check Pachymetry calibration	8.3.12.2 Check cell density (p196) 8.3.13 Pachymetry accuracy check (p203) 8.4.2 Endo image calibration (p214) 8.4.3 Pachy calibration (p222)
32107-6200	Simple calibration jig		Pachymetry calibration	8.4.3 Pachy calibration (p222)

## 9.9 Adjustment List

### 9.9.1 Adjustments after unit replacement

Replacement parts		7.1.1 Main body (p65)	7.1.3 R/L motor ASSY (15201-2510) (p80)	7.1.4 LCD ASSY (14101-6100) (p83)	7.1.6 Joystick ASSY (10701-1260) (p87)	7.1.7 Patient positioning ASSY (15411-1500) (p88)	7.1.8 Chinrest ASSY (15411-1510) (p88)	7.1.9 Brake ASSY (30601-2300) (p89)										
Adjustment item	8.3.1 Power supply check (p150)																	
	8.3.2 Tracking check (p151)																	
	8.3.3 Switch check (p154)				○	○	○											
	8.3.4 Touch panel check (p156)			○														
	8.3.5 Print check (p158)																	
	8.3.6 Video print check (p159)																	
	8.3.7 Chinrest check (p160)					○	○											
	8.3.8 Tracking check (p162)		○															
	8.3.9 Camera check (p171)																	
	8.3.10 Fixation check (p172)																	
	8.3.11 Joystick check (p175)				○													
	8.3.12 Endothelium measurement accuracy check (p176)																	
	8.3.13 Pachymetry accuracy check (p203)																	
	8.4.1 Tracking adjustment (p211)		△															
	8.4.2 Endo image calibration (p214)																	
	8.4.3 Pachy calibration (p222)																	
	8.4.4 Touch panel calibration (p236)			○														
	8.5.1 Software version check (p238)																	
	8.5.2 Firmware upgrade (p239)																	
	8.5.3 Adjustment data recovery (p242)																	
	8.6.2 LAN settings (p246)																	
	8.6.3 Reader settings (p255)																	
	8.6.4 Touch panel calibration (p258)																	
	8.6.5 Date and time setting (p260)																	

## 9.9.2 Adjustments after board replacement

Replacement parts		7.2.1 Main board (15201-BA01) (p90)	7.2.2 Driver board (15201-BA02) (p92)	7.2.3 Base board (15201-BA05) (p93)	7.2.4 Connection board (15201-BA08) (p94)	7.2.5 TRC sensor board (15201-BA11) for right/left movement (p95)	7.2.6 TRC sensor board (15201-BA11) for forward/backward movement (p96)	7.2.7 TRC sensor board (15201-BA11) for up/down movement (p97)	7.2.8 Peripheral fixation lamp board (15201-BA18) (p98)	7.2.9 Fixation lamp board (15201-BA19) (p99)	7.2.10 LCD board (14101-BA06) (p100)	7.2.11 F/R/L sensor board (18536-BA25) (p102)	7.2.12 U/D SW board (30601-BA09) (p103)						
Adjustment item	8.3.1 Power supply check (p150)																		
	8.3.2 Tracking check (p151)					○	○	○											
	8.3.3 Switch check (p154)												○						
	8.3.4 Touch panel check (p156)										○								
	8.3.5 Print check (p158)																		
	8.3.6 Video print check (p159)																		
	8.3.7 Chinrest check (p160)												○						
	8.3.8 Tracking check (p162)					○	○	○				○							
	8.3.9 Camera check (p171)																		
	8.3.10 Fixation check (p172)								○	○									
	8.3.11 Joystick check (p175)																		
	8.3.12 Endothelium measurement accuracy check (p176)	○	○																
	8.3.13 Pachymetry accuracy check (p203)	○	○																
	8.4.1 Tracking adjustment (p211)	△	△			△	△	△											
	8.4.2 Endo image calibration (p214)	△	△																
	8.4.3 Pachy calibration (p222)	△	△																
	8.4.4 Touch panel calibration (p236)	△	△								○								
	8.5.1 Software version check (p238)																		
	8.5.2 Firmware upgrade (p239)																		
	8.5.3 Adjustment data recovery (p242)	○	○																
	8.6.2 LAN settings (p246)	○	○																
	8.6.3 Reader settings (p255)																		
	8.6.4 Touch panel calibration (p258)																		
	8.6.5 Date and time setting (p260)	○	○																

### 9.9.3 Adjustments after electrical component replacement

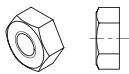
Replacement parts		7.3.1 Primary power source (15201-EA01) (p104)	7.3.2 Power LED (14101-EA60) (p105)	7.3.3 Brushless geared motor (15201-E006) (p107)	7.3.4 Pulse motor (15201-E007) (p108)	7.3.5 Brushless geared motor (15601-E008) (p111)	7.3.6 Chinrest (32186-EA53) (p113)	7.1.5 Pad-attached LCD ASSY (14101-6110) (p85)	7.3.7 Printer (80606-00018) (p114)	7.3.8 Printer interface board (80606-00019) (p116)	7.3.9 Switching regulator (80602-00102) (p117)						
Adjustment item	8.3.1 Power supply check (p150)	○									○						
	8.3.2 Tracking check (p151)			○	○	○											
	8.3.3 Switch check (p154)																
	8.3.4 Touch panel check (p156)							○									
	8.3.5 Print check (p158)								○	○							
	8.3.6 Video print check (p159)																
	8.3.7 Chinrest check (p160)						○										
	8.3.8 Tracking check (p162)			○	○	○											
	8.3.9 Camera check (p171)																
	8.3.10 Fixation check (p172)																
	8.3.11 Joystick check (p175)																
	8.3.12 Endothelium measurement accuracy check (p176)																
	8.3.13 Pachymetry accuracy check (p203)																
	8.4.1 Tracking adjustment (p211)			△	△	△											
	8.4.2 Endo image calibration (p214)																
	8.4.3 Pachy calibration (p222)																
	8.4.4 Touch panel calibration (p236)							○									
	8.5.1 Software version check (p238)																
	8.5.2 Firmware upgrade (p239)																
	8.5.3 Adjustment data recovery (p242)																
	8.6.2 LAN settings (p246)																
	8.6.3 Reader settings (p255)																
	8.6.4 Touch panel calibration (p258)																
	8.6.5 Date and time setting (p260)																

## 9.9.4 Adjustments after mechanical component replacement

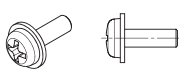
Replacement parts		7.4.1 R/L shaft (30601-M201) (p118)	7.4.2 F/B shaft (30601-M103) (p119)	7.4.3 Linear bush (82001-LM028) (p121)	7.4.4 Linear bush (82001-LM097) (p123)	7.4.5 Shading plate (32186-M051) (p125)	7.4.6 Multistage stay (14101-M639) (p126)	7.4.7 Sliding plate (32105-M102) (p129)	7.4.8 U/D sensor plate (15201-M213) (p130)	7.4.9 R/L sensor plate (15201-M260) (p131)	7.4.10 F/B sensor plate (15201-M259) (p132)	
Adjustment item	8.3.1 Power supply check (p150)											
	8.3.2 Tracking check (p151)											
	8.3.3 Switch check (p154)											
	8.3.4 Touch panel check (p156)											
	8.3.5 Print check (p158)											
	8.3.6 Video print check (p159)											
	8.3.7 Chinrest check (p160)					○						
	8.3.8 Tracking check (p162)								○	○	○	
	8.3.9 Camera check (p171)											
	8.3.10 Fixation check (p172)											
	8.3.11 Joystick check (p175)											
	8.3.12 Endothelium measurement accuracy check (p176)											
	8.3.13 Pachymetry accuracy check (p203)											
	8.4.1 Tracking adjustment (p211)											
	8.4.2 Endo image calibration (p214)											
	8.4.3 Pachy calibration (p222)											
	8.4.4 Touch panel calibration (p236)											
	8.5.1 Software version check (p238)											
	8.5.2 Firmware upgrade (p239)											
	8.5.2 Firmware upgrade (p239)											
	8.5.3 Adjustment data recovery (p242)											
	8.6.2 LAN settings (p246)											
	8.6.3 Reader settings (p255)											
	8.6.4 Touch panel calibration (p258)											

## 9.10 Screw List

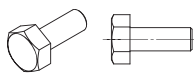
**N** ナット六角(1種)  
HEXAGON NUT-1



**BS** セムスネジ(SW+PW付)  
SEMS FASTENER(with SW+PW)



**HB** 六角ボルト  
HEXAGON HEAD BOLT



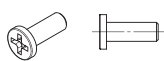
**SW** ワッシャスプリング  
SPRING WASHER



**3N** ナット六角(3種)  
HEXAGON NUT-3



**CK** 小ネジ(0番1種なべ)  
MACHINE SCREW(Pan head)



**HH** 止めネジ六角穴付  
HEXAGON SOCKET SET SCREW



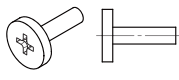
**TB** シンヘッドネジ  
MACHINE SCREW(Thin head)



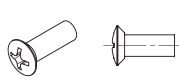
**3PW** ワッシャ平(3種)  
WASHER-3



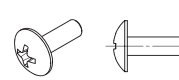
**3CK** 小ネジ(0番1種なべ)  
MACHINE SCREW(Pan head)



**OC** 小ネジ丸皿  
MACHINE SCREW(Oval head)



**TC** 小ネジトラス  
MACHINE SCREW(Truss head)



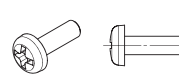
**4W** ワッシャ平(特殊寸法)  
WASHER(Special size)



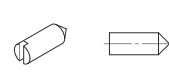
**CT** 止め輪C型  
RETAINING RING-C TYPE



**PC** 小ネジなべ  
MACHINE SCREW(Pan head)



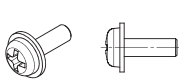
**TG** 止めネジすり割付  
SLOTTED SET SCREW



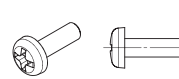
**5W** ワッシャ(ポリスライダ)  
WASHER (Polyslider)



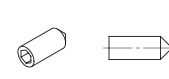
**DS** セムスネジ(TW付)  
SEMS FASTENER(with TW)



**PT** タップタイトネジ(なべ)  
TAPPING SCREW(Pan head)



**TH** 止めネジ六角穴付  
HEXAGON SOCKET SET SCREW



**6W** ワッシャ(ナイロン)  
WASHER (Nylon)



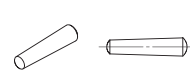
**ET** 止め輪E型  
RETAINING RING-E TYPE



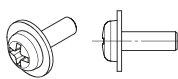
**PW** ワッシャ平小型丸(1種)  
WASHER-1



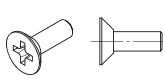
**TP** テーパーピン  
TAPER PIN



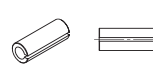
**AS** セムスネジ(SW+3PW付)  
SEMS FASTENER(with SW+3PW)



**FC** 小ネジ皿  
FLAT HEAD SCREW



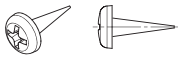
**RP** ピンスプリング  
SPRING PIN



**TW** 歯付き座金  
STAR WASHER



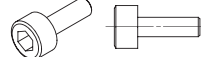
**AT** タッピングネジ(木ネジ用)  
TAPPING SCREW(Wood screw)



**FG** 止めネジすり割付(平先)  
SLOTTED SET SCREW(Flat point)



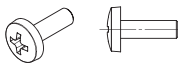
**SB** ボルト六角穴付  
HEXAGON SOCKET HEAD CAP SCREW



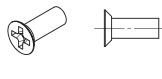
**WW** ワッシャ波  
WAVE WASHER



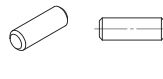
**BC** 小ネジ(バインド)  
MACHINE SCREW(Binding head)



**FK** 小ネジ(0番1種皿)  
MACHINE SCREW(Flat head)



**SP** ピン平行  
STRAIGHT PIN



### 処理 Treatment

BCr 黒クロームメッキ  
Chrome plate:black

SUS ステンレス  
Stainless

※ZnBr3 三価黒クロメート  
Trivalent chromate:black

Cr クロームメッキ  
Chrome plate

ZnC3 三価クロメート  
Trivalent chromate

※(ZnBr3は省略)(ZnBr3 omitted)

This page is intentionally left blank.